[From Schenckius: Observationum Medicarum, Francofurti, 1609.]

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THE MEDIEVAL PHYSICIAN*

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To become the first William Snow Miller lecturer is an honor which I gladly accept, albeit with full realization of the grave responsibility of my task. I am not come to hold a candle to the sun, but to congratulate you upon this decision you have made to demonstrate, during his life time, your affectionate admiration for a man who has done much to add to the sum of human knowledge, as the recent bibliography of contributions from the Anatomical Laboratory amply testifies, and who, by his influence and ensample, by his erudition and his very being, has contributed still more to our common heritage. "Small erections may be finished by their first architects" wrote Herman Melville, "grand ones, true ones, ever leave the cope-stone to posterity." By his writings on the history of science Doctor Miller has manifested his conviction of the continuity of research, towards which his own great contribution on the lungs has given so direct an impetus. It is the attitude of an optimist; as an optimist he has inspired us. And to the optimist we bring our grateful acknowledgement this day.

It is said of Odin, the All-Father, that he gave of himself to all his sons. The theme is old but it is very true. In the 1485 Caxton edition of Mallory you will find it in another guise. Sir Bors de Ganis upon the quest of the Sangreal:

> . . . looked up into a tree, and there he saw a passing great bird upon an old tree, and it was passing dry, without leaves; and the bird sat above, and had birds, the which were dead for hunger. So he smote himself with his beak, the which was great and sharp. And so the great bird bled. And the young birds took the life by the blood of the great bird. When

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Bors saw this he wist well it was a great tokening and he took his horse and yede away.

In the British Army, and no doubt in others, it is directed that orders shall be given in a "loud, firm and cheerful voice." That is the voice which inspires us to follow our optimistic leader. Catching something of the vision of him in whose honor we are met I propose to set before you a pageant of the times preceding ours, sketching the progress of thought which formed the background for development of scientific medicine. It is the spirit which is permanent and immortal. Hence it is the spirit of the physician which we emphasize, not his actual achievement.

Prologue

We often hear it said of a man that he is centuries ahead of his times. That loose statement, properly interpreted, would make of its victim a pathological curiosity. It is the time which makes the man possible. "Our opinions are grafted one upon another." Montaigne wrote: "Whence it followeth, that the highest mounted hath often more honour than merit For hee is got-up but one inch above the shoulders of the last save one." So strongly do I feel the force of this contention that I have resolved to lay before you, as well as imperfect knowledge permits, a sketch of the Middle Ages themselves, and to place each physician in the setting of his day. To this end also the successive pictures thrown on the screen are designed, somewhat as an obligato for the melody of my theme or as a Greek chorus to the play. Each slide has its definite significance but as it is impossible to portray fully the half millenium through which our journey takes us, many slides will be passed over in silence, their function being fulfilled in rounding out my story which cannot be adequately set to words.

I would fain have given you more details of the life and work of each character but I am an inept Latin scholar, spelling my way through the medieval writings much as my ancestors thumbed along the lines of Tyndale's Bible, so that my father was used to echo the sentiments of Sir Henry Slingsby, a cavalier who fought for Charles I. Sir Henry, noting that his son, aged five, was becoming "duller to learn" confided to his diary that "They do ill that do foment and cherish that humour in a child and by inventing new sports increase his desire to play, which causeth a great aversion to their book; and their mind being at first season'd with vanity will not easily loose the relish of it."

Ideas come to us aplenty; they are our own. But words are limited in number and significance. We build our sentences with these little blocks of language and who shall say where we have gathered them. Charles Reade accused of plagiarism retorted: "I have milked 300 cows but the cheese therof is mine." I cannot tell you where the words came from which I shall use nor where the phrases dipped themselves for colour. "I am no cutpurse of another's wit" protested Sir Philip Sydney but he borrowed a phrase of Petrarch's to say it.

The story divides itself conveniently into three periods which are also the periods of chivalry, from its dawn with Tancred, through its zenith with the Black Prince, to its setting with Drake. So I shall pause between the phases that you may know where we stand, and for headings I have chosen the names of those cities most closely bound up in my tale, Salerno, Padua, Basel.

Salerno

In one of his stories[1] Lord Dunsany tells of a mountain lifting sheer above London, part crystal and part mist, where the dreamers go when the sound of the traffic has fallen. At first they dream lightly for the roar is still echoing in their ears but as the evening wears on the dream galleons set out, some East, some West, some into the Future; many to the olden harbours of the Past, sailing over the years as over the spaces, for thither the sighs of men are mostly turned and, as the merchantmen before the trade winds along the coast of Africa, so bear the dreamships down to where Romance sits cloaked upon the distant hills.

Back for a thousand years our journey takes us, back and toward the East, into that half light of history when the adventures of the common man first set themselves successfully by those of Kings, when the swift advance of the Turks upon the Byzantine Empire seemed like the onset of a final disaster and Michael VII appealed to Gregory VII for aid. The earliest shafts of medieval dawn were striking through the dark ages with a promise of splendour to follow. So with a racing tide and midnight bustle, a hurrying to and fro and the babel of many diverse tongues we find ourselves beside the church whose bells are ringing for the first crusade. Tapers light fitfully the image of Saint George of Cappadocia and the prostrate dragon. And Christopher, the patron saint of travellers, must have his prayer. The living God and the cold presence of the dawn enter the shrine together. A light breeze, a ripple on the prow, and we are off for the great adventure.

It is no easy matter to weave together the ravelled threads of history from the end of the dark ages and to disentangle them from wisps of legend. Intrigue followed confusion and violence followed intrigue. For the days of comparative safety and reasonableness when Haroun-al-Raschid of the Arabian Nights sent Charlemagne the keys of the Holy Sepulchre, had given place to a chaos which thrust apart France and Germany, Christendom and Islam; a chaos of which the world has been reaping the results even down to the years of our own great bloodshed.

Yet through all these times of lawlessness and misery millions of faithful anonymous lives kept secure the spirit that lies at the core of Christianity and preserved it to make a better world possible at last. The oldest thing in England, the church tower of Earls Barton, still stands, a silent witness to gracious kindly souls who built it in the eighth century, during that peace after the union of the country, when England lay apart and free, while German paganism was tamed by Charlemagne. Unhappily the Scandinavian terror was still to come and shake the very fabric of Catholic civilization.

Spreading over the West, bands, first of mercenaries, then invaders, known variously, but for our purpose best characterized as Northmen, forced the Pope and the Byzantine Emperor into a weak and ineffectual defensive alliance. For they came through the Rhineland and Italy. They carried their ships by portages through Russia and appeared upon the Black and Caspian seas. Among the former was a certain Robert Guiscard, son of Tancred de Hauteville in Normandy who arrived in Italy as a pilgrim adventurer and was made Duke of Apulia in 1056. This man whose career begins, in spite of noble birth, as that of a brigand in Calabria, assisted in conquering Sicily from the Saracens (1060–1090) who had slowly overrun it, and crossing to the mainland, took Salerno in 1077. In 1081–1082 he defeated the Byzantine Emperor Alexius Comnenus at Durazzo, but by force of events at home returned to Italy instead of pressing on towards Constantinople. In 1084 he stormed Rome, freed the Pope Gregory VII from the Castle of San Angelo, built from Hadrian's tomb, and took him to Salerno for safety.

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[1] The unhappy body: See A Dreamer's Tales, p. 100

At the same time the Seljuk Turks swept down through Baghdad, overran Armenia, turned the mountain ranges of Cilicia and established themselves at Nicaea over against the capital of the old Byzantine Empire. Islam was reunited and the Holy Places fell into the charge of a people unsympathetic toward Christian pilgrims and traders. A tax was levied on all who would enter Jerusalem. Extortion and murder quickly followed and Christian trade, politics and religion found themselves intolerably menaced.

The old Byzantine Empire, so recently secure, was on the brink of dissolution. Michael VII appealed to Gregory for help but Gregory was harassed by the onslaught of the Emperor Henry IV and had to be rescued by Robert Guiscard from the castle of San Angelo, thenceforth the papal stronghold. Gregory survived this episode by a short year. Between his death and the accession of Urban II, for half a year there was a pope, called from the monastery of Monte Cassino, Desiderius, abbot of that house, who took the name Victor III. This man is important to us because one of his monks was Constantine the African with whom our story opens. Before we look at the physician, however, it is necessary to learn a little more of the times in which he lived.

The world for its sin was to come to an end in A.D. 1000. That did not happen but by slow degrees a new movement brought back to life the blurred idea of Christian unity and under Gregory the Western Catholic church once more stood purged and clean and hopeful. In the district called Smithfield in London, a penny ride from the College of Surgeons in Lincoln's Inn Fields and hard by Saint Paul's, arose the White walls of a new church of Saint Bartholomew the Great, destined to figure in all later medical history through the magnificent gift by Rahere of the hospital built around it.

On both sides of the channel the Northmen had become supreme. In 1066 William (the Conqueror), son-in-law of the powerful Baldwin of Flanders, compacted in a clot of relationships of blood and marriage with the great house of Capet, ascended the English throne, which now became, through the assistance of Lancfranc of Canterbury, a stronghold of the Catholic Church. This country in its sea-girt isolation, upheld the Pope, while it resisted intrusions on the secular power, until the tragedy of the sixteenth century swept out the monasteries and closed the doors to foreign dominion even in religion. All through our story historic events bring light upon the problems of our day and this event is no exception, for whether in the matter of papal revenue, as Belloc points out, or of postwar debts, the effect of time, which will make of any impost, however naturally accepted in its origins, an intolerable burden at last, plays its certain and foredestined part.

Urban II, of Cluny, a worthy successor of Gregory, became pope in 1087, the year of William's death. Zealous he was for Christian unity, longing for the end of petty strife between the several factions in Europe itself, anxious to preserve the trade routes and the pilgrim ways. A repeated request for aid, this time from Alexius the son of Michael decided Urban at once to declare a Holy War against the invaders of the Sanctuary and thus in 1095 the First Crusade began. A unifying emotion spread over Western Europe more rapidly than the plague of Saint Anthony's Fire which preceded it. One, Peter the Hermit, dwarfish in stature and mean in person, but like Micah the prophet, filled with a fire which could not be stayed, rode his ass throughout the countries of Europe, restless, emaciated, barefooted and bareheaded, carrying on the huge cross a bleeding sign of what he himself had seen. Nay, he had received from the Saviour a letter which had fallen down from heaven.

> Come now therefore I pray you, curse me this people that we may smite them and I may drive them out of the land, who hate the good and love the evil, who also eat the flesh of my people and flay their skin from off them: and they break their bones and chop them in pieces, as for the pot, and as flesh within the cauldron. And many nations shall come and say let us go up into the mountain of the Lord. And he shall judge among many people and rebuke strong nations afar off. And they shall beat their swords into plough shares and their spears into pruning hooks, neither shall they learn war any more.

How terribly familiar it all sounds. The vehemence which choked his own utterance became contagious and called forth the tears and cries of the vast crowds which followed him everywhere and swore to right the wrongs of those whose harrowing stories filled their listening ears.

Godfrey of Bouillon; his brother Baldwin of Flanders; Stephen of Chartres and Blois; Hugh of Vermandois, the brother of Philip of France; Raymond of Toulouse; Bohemund son of Robert Guiscard; and Tancred the flower of Chivalry, Bohemund's nephew; Robert of Normandy, son of the Conqueror; Adhemar, bishop of Puy and thousands of lesser name flocked to the call. But the common people started first in a motley throng under Peter the hermit and Walter the Penniless. All too quickly the high ideals with which the Christian hosts set out degenerated into hideous scenes rivalling in horror the wrongs they sought to abate. Pogroms of Jews, massacres of Hungarians fill the pages of the People's crusade, until at last this mob itself of errant humanity was massacred almost to a man under the walls of the Turkish stronghold of Nicea and the very bastions of a fort were built out of their bones.

Soon the greater host drew near to the straits which separate Europe from Asia, Constantinople from Nicaea. Wrote Stephen of Chartres to his wife.

> Some people are wont to say that the arm of the sea at Constantinople is raging and perilous, but one need feel no more uncertainty at all on it than on the Marne or Seine! . . . And, God triumphing, the very large city of Nicaea was surrendered on the thirteenth day before the Kalends of July. And this city which became a mistress of error, now by the Mercy of God, has been made, through his sinful servants, a disciple of truth. Farewell.

Onward the Christian hosts chanted and fought their way to Jerusalem. Not five months as Stephen had hoped but three weary battle-stained years intervened before the athletes of Christ, haunted by thirst, threw themselves upon their faces by the pool of Siloam whose unaccountably ebbing waters mocked their torture. Round the city as round Jericho of old the besiegers marched and then, living men and ghosts of martyred dead together, swept over the battlements and into the city of David. So, forcing their horses knee deep through the quivering mass of dead and dying Saracens, their nostrils filled with the pungent smoke from thousands of immolated Jews, these followers of the Lamb of God entered the church of the Holy Sepulchre to do homage before the tomb of their Lord and settle an undying heritage of bitterness and strife upon their children's children forever.

Into this picture of 800 years ago we fit the first physician of the Middle Ages. Disguised as a common soldier there came up from Sicily with the army of Robert Guiscard to the taking of Salerno in 1077, one Constantine the African who, as tradition tells us, after nine and thirty years spent in the East, fled from his native city of Carthage under charges of magic and necromancy. Discovered as a physician in such circumstances must soon be, he was bidden to the court, but his soul hungered for a peace that was greater than temporal honour and before long he joined the goodly company of Benedictine monks at Monte Cassino. There, encouraged by Desiderius, the abbot, he wrote his great "Pantegni," the first Christian work on medicine of medieval days.

Much has been made of Salerno as a medical center and indeed there did grow up in that city, as was natural at such a strategic point of the travel routes between East and West, a medical school, later enriched by Frederic II. But whether there was a recognized University in Constantine's day or no we cannot tell. Probably the times were too restless and comparative freedom from assault too new for such a thing. The mists of legend and misunderstanding of foreign words still shroud the truth in obscurity. The famous woman physician Trotula disappears when we realize that Trotula is merely a term used for womankind in general. During the next century many names appear in medical literature identified with Salerno and most trace their allegience to the great and authoritative work of Constantine.

The medical literature of the twelfth century resembles anatomical textbooks of today in that one is largely copied from another without specific references. We do not, however, accuse these modern textbook writers of plagiarism; nor indeed ought we to fix this charge upon

Constantine who undoubtedly drew largely and in many places entirely upon Ali Abbas, who wrote in Arabic a century before. Then as now there were differencs of opinion and active discussion ensued. Corner of Rochester has recently given us the opportunity to examine some of these discussions and one is particularly significant because the writers of anatomical textbooks from that time to this have followed the less exact but more eloquent and persuasive writer. The flanks are occupied in life by ascending and descending colons, the lateral intestines, as was correctly described by a shadowy figure of a man called Copho, on the basis of the earlier work of Galen. But the author of the Second Salernitan Demonstration "had never found anything written about them except in the recent booklet," and assigned this space to small intestine which indeed lies there after death. Writer after writer for 800 years has placed the small intestine in the flanks, whereas the practicing physician, who by great good fortune has forgotten his stereotyped anatomical instruction, knows that the flanks are indeed occupied by the large bowel, and small intestine only reaches there in spastic conditions of the colon.

But we must leave the disputations of the so-called Salernitans and hasten onward. For Salerno was displaced as the center of learning by other more Western cities.

PADUA

We have reached the twelfth century with its increase in town life, the revival of trade and a great impetus toward building. Abbeys, monasteries and cathedrals sprang up everywhere like beautiful flowers in stone. Every city of size boasted its new market hall, white with dust from the mason's hand. The structure and ideals of society were changing. On one side the insatiable thirst for knowledge, the craving to discover new sources of intellectual and imaginative enjoyment; on the other the dim yearnings and unsatisfied longings of religion and the growing awe of the supernatural. In their monotonous isolation, splendid or squalid according to their means, men welcomed the arrival of some professional wayfarer. Pilgrims with their licensed exaggeration; friars with tales of the saints outwitting the Devil, gleemen, jugglers and all the tribe denounced by Piers Plowman as Satan's children, were welcomed as links with the outside world, purveyors of news, of rumour and gossip, carriers of fables and incidentally of not a few new thoughts and fresh ideas. The epic of the old minstrels had disappeared before the *chansons de geste*, the songs of feats of arms of the time of Charlemagne, and these again were giving place to the full-grown romance of chivalry where knights and ladies were perfect from birth in gentleness and grace and rogues were villains full blown in crime.

So in the market place and by the wayside common men were questioning the morals and good faith of the clergy, the justice of papal taxation, transubstantiation, vulgar dreams of the elixir of life and the philosopher's stone, and the deeds of famous men.

Ascending the tower of Notre Dame, and standing among Victor Hugo's gargoyles one can look across the Seine to the old site of the Abbaye St. Victor, now occupied by the Halle aux Vins, where Abelard taught and St. Bernard lodged during the first half of the twelfth century.

The wandering minstrel and professional philosopher were united in Abelard who, by his teaching in this famous place, founded the University of Paris, the seat of learning which could make even popes to tremble.

Of a sudden the voices ceased, and, turning her head, Héloïse saw a short man, of square build, who, although well advanced in the thirties, still conveyed an impression of youthfulness; for though squarely built his figure was well knit, his eyes were bright, and his skin fresh and not of an unpleasing hue, brown and ruddy. The day being warm, he walked carrying his hat in his hand, looking round him pleased at the attendance, and it was his look of self-satisfaction that stirred a feeling of dislike in Héloïse. He seemed to her complacent and vain; and she did not like his round head, his black hair, his slightly prominent eyes: solemn eyes, she said to herself, and I like merry eyes; the only feature that forced an acknowledgement from her was his forehead, which was large and finely turned. But her admiration of it passed away quickly in her dislike of his blunt, fleshy nose. His name had often been mentioned in her presence, she was even familiar with it, and had she thought about him at all she would have imagined a thin, finely cut profile, sensitive nose and pointed chin. She could not imagine Aristotle or Plato—Plato still less than Aristotle—or Seneca, or Virgil, or Ovid, or Tibullus (but these last were poets), converging to the type that Abélard represented so prominently. She had seen his broad, almost clerical, face before, dimly, it is true, but she had seen it in certain prelates, and the thought rose up in her mind that philosophy wore an altogether different appearance. But as soon as he spoke her feelings about him changed as the world changes when the cloud passes and the sun comes out. The voice had much to do with the transformation, but not all; it gave beauty to his very slightest utterance; and the phrases that caught upon her ear were well worded. He speaks good Latin, she said to herself, and the words had hardly passed through her mind when another thought whispered to her: were Plato and Aristotle dandies? Half-an-hour must have been spent in the donning of the laces at his cuffs and another in choosing the buckles of his shoes. But her criticism of his apparel was quickly swept away again by the sound of the smooth, rich, baritone voice, and this time she perceived that the voice was accompanied by an exquisite courtesy, and that the manner in which he walked addressing those who gathered about him to admire and to listen was kindly, although it was plain that though familiarity from him would be an honour he would resent it quickly in another.

The students gave way before him; he smiled upon all, waved his square hand, stopping before one who, on the approach of the master, strove to obliterate a circle that he had drawn on the gravel with his stick. On seeing the circle and divining the use of it, Abélard stepped forward from his admirers and held a little court before proceeding into the cloister to hold his greater court. A circle, he said, is a figure in which all the lines drawn from the centre to the circumference are equal; and of the lines there may be any number. But some of you would say that I can add another hundred lines and another two hundred lines, but a moment comes when no more lines can be added, and this puts into the arguer's mouth the question: does the circle exist? Hence all the difficulties that we know of have arisen, for the circle does not exist in substance. But it exists in the mind, and the mind is something, therefore the circle exists. On these words, amid many acclamations Abélard resumed his resolute gait, exchanging words with those whom he knew, smiling encouragingly, inviting all to follow him to the cloister.

It was the day of Abelard but even thus early the passion for knowledge encountered and was worsted by the mystical idealism of the Church. Bernard, the Cistercian, became Abbot of Clairvaux in 1115 and by his saintly life and eloquence attained an unexampled influence in Christendom. Fra Lippo Lippi's painting represents him as a dreamer, "the mellifluous doctor." But I have another picture of him in my mind. In 1132 a group of monks picked their way along the pleasant lanes of England to the cathedral city of Canterbury singing as they walked one of the hymns of their devoted Abbot.

Jesu the very thought of Thee
With sweetness fills my breast,
But sweeter far Thy face to see,
And in Thy presence rest.

Filing into the presence of the English King, their leader delivered his message:

> To the illustrious Henry, King of England, Bernard, Abbot of Clairvaux, that he may faithfully serve and humbly obey the King of Heaven in his earthly Kingdom.
>
> There is in your land a property belonging to your Lord and mine, for which He preferred to die rather than it should be lost. This I have formed a plan for recovering, and am sending a party of my brave followers to seek, recover and hold it with a strong hand, if this does not displease you. And these scouts whom you see before you I have sent beforehand on this business to investigate wisely the state of things, and bring me faithful word again. Be so kind to assist them as messengers of your Lord, and in their persons fulfil your feudal duty to Him. I pray Him to render you in return, happy and illustrious, to His honour, and to the salvation of your soul, to the safety and peace of your country, and to continue to you happiness and contentment to the end of your days.

Then gathering up their staffs and wallets these holy men passed out again into the sunshine and, meditating, chanted with the birds:

Nor voice can sing, nor heart can frame,
  Nor can the memory find
A sweeter sound than Thy dear name
  O Saviour of Mankind.

Thus Bernard of Clairvaux, that saintly man, who ruled the countries of Europe from a cell. But the die was cast. Philosophy and religion were at grips. And eight years afterward, at the Council of Sens, the battle fell to the Church for Bernard was largely instrumental in securing the condemnation of Abelard for heresy.

These shadows pointed the intolerance which was to follow. To many it seemed that the world, through prosperity, was slipping once more into unpardonable sin. Bernard of Cluny, homesick of a Heavenly homesickness, wrote the most beautiful of medieval hymns:

Hora novissima, tempora pessima sunt,
  vigilemus
Ecce minaciter imminet arbiter ille
  supremus

Let us keep watch these later days for the times are evil indeed and the Judge of all the world draws threateningly near.

It falls upon our ear with prophetic force for the Church was shortly to choose between persuasion and violence and it chose the latter. Saint Francis of Assisi for whom the very swallows ceased their twittering that his voice might be heard was scarcely mouldered in his grave before they hunted his first disciple Brother Bernard like a wild beast through wood and hill. Saint Dominic the Spaniard became the emblem of the Church's will. "For many years," he said in his last discourse to the heretics "I have exhorted you in vain, with gentleness, preaching, praying and weeping. But according to the proverb of my country, where blessing can accomplish nothing, blows may prevail." The Waldenses and the Albigenses were rooted out. Eighty years after his death four followers of the gentle Saint Francis were burned alive in the market place of Marseilles and the Medieval Church was well started upon that course of fire and torment in which along with the blackened bodies of poor and insignificant people its own great mission to mankind sank forever out of recognition.

There is one who must be mentioned because he forms a well-known landmark of this period, namely Roger Bacon (*ca.* 1210–1293), a Franciscan monk of Oxford. He is extolled as centuries ahead of his time by those who overestimate his ability, and so persistently underestimate the range of thought, the depth of knowledge of the times. Usually these know only Jebb's edition of his *Opus maius* which ends with the sixth part on experimental science and omits the important seventh on moral philosophy. Actually he was an honest, shrewd, irascible, tactless, intolerant Englishman who repeated the appeal of Albertus Magnus for treatment of problems by mathematical method much as has become the vogue today. Yet he pours infinite scorn on the mathematicians themselves who are content with nothing less than a demonstration and spend 30 to 40 years seeking it on one problem alone. "Experiment, experiment," he reiterates, yet his formula is not really helpful. "First one should be credulous until experience follows second and reason comes third." He was destructive rather than constructive and though in contemporary medicine he detected "thirty-six great and radical defects with infinite ramifications," his own contribution is negligible. "If I had my way," he wrote, "I should burn all the books of Aristotle, for the study of them can only lead to a loss of time, produce error and increase ignorance." This however is the reasonable sentiment afterwards also expressed by Paracelsus regarding authorities who were not so much read as worshipped.

Now at this period, born in the village of Abano four miles from Padua, arose Peter, surnamed the Conciliator for the vigour of his effort to harmonize the various conflicting schools of thought of his day. This man studied at Paris, was there made Doctor of Physic and Philosophy, was regarded as a second Aristotle and called "the great Lombard." He was born in 1250, exactly nine months and fourteen days after conception as he himself tells us he learned by astrological scrutiny and from his "most careful mother." By popular account he was the most highly salaried part-time professor of medicine any university has ever had. His stipend has been repeatedly stated at 500 lire a month, a purchasing value of $3000 just before the Great War, or $6000 today. There seems, however, some ground for assuming that this sum was rather that conjured by the excited imagination of less-favored colleagues and that neither in this nor in the vast sums which he is supposed to have derived from his undoubtedly lucrative practice is the popular version to be trusted. Certainly the Pope Honorius IV paid him a large daily sum for medical attendance but this also has been wildly exaggerated in repetition.

His chief work is the "Conciliator" wherein he strove to reconcile and harmonize the conflicting views of physicians and philosophers who had gone before. This enormous volume, of which we have a beautiful copy in the Anatomical Laboratory, is the most difficult to read of all the medieval Latin works. The man's knowledge is so rich, so varied and so profound. And one must bear every argument in mind until he has quoted all authorities, made all his observations, balanced and cross-referenced every scrap of information. For example, in arguing whether a child born in the eighth month will live, Peter discusses perfect and imperfect numbers for three columns and then declares that natural phenomena cannot be proved by arithmetical numbers, since they are not caused by them. Again we find one chapter of five columns on whether a large head is a better sign than a small one. In this it seems at first that since all sensations, save only touch, are lodged in the head, a large one should be best. But then good Peter discovers that women have small heads and yet they are more sensitive and have good qualities in greater abundance than men. So it appears that a small head is better. When one gets used to this idea the argument comes along that after all women's bodies are smaller than mens' and require smaller brains and therefore smaller heads. And so on interminably. Astrology and hypnosis he firmly believed in and when he came to die, three noble sciences he said had occupied his life, of which one, philosophy, had made him subtle; the second, medicine, made him rich; and the third, astrology, made him a liar. But he was not suffered to lie in peace for the Holy Inquisition burned his effigy and perhaps his bones, though tradition has it that the body was removed in time by faithful followers and deposited in a nameless grave where alone it might rest secure.

Peter of Abano died in 1318, just three years before Dante, and the life of each brings to its climax a period in history, the one in medieval medicine the other in medieval literature. The Gothic cathedral is its symbol, the purest product of medievalism. Weird tales were whispered concerning the pillars of the pointed arch and of how the cathedral reached such heights. With shuddering awe the people told how even the Evil One himself could not be excluded from the House of God. Here he smuggles his buildings into the church itself, there he hurtles the master-builder from the half-built tower. The edifice, unfinished, now begins to fall to pieces and no one can say which pillar was built in honor of God and which in honor of the Devil. So, erring in judgment and doubtful in deed though single-minded in ideal as man in his frailty can be, the figures of the pageant pass. We have seen the devotion of Gregory, the pious wealth and valour of Godfrey de Bouillon, the skill and resources of Constantine the African, the vigorous penetration of Abelard, the silent contemplation of Saint Bernard, the glowing simpleness of heart of Saint Francis, the fanatic zeal of Saint Dominic, the shrewd fatuous honesty of Roger Bacon, now crowned by the graceful arguments of Peter and the wistfulness of Dante, each striving as he might "to spread a light of Love which makes the angels glad," each failing in his effort more or less. And now the world is growing ready for another of those ponderous experiments by which the Almighty constantly diverts the course of history.

There is no immediate evidence of this. Wealth was increasing, ease more obvious, the cities flourished, more students than ever thronged the universities and then suddenly without warning in the middle of the fourteenth century that awful harbinger of change, the Black Death.

Upon a morning in 1348 Boccaccio in Florence, looking from his window, saw two hogs rooting among the rags of a poor man just dead, and shaking them about in their mouths "when they both turned round and died on the spot." All the previous year the Plague had come creeping westward, half ruining the Mediterranean ports. July 7, 1348 it crossed the sea and men fell dead in Melcombe Regis, the Dorset port now known as Weymouth. More than half the priests in Yorkshire, two-thirds of the students at Oxford, between a quarter and a half of the people of England perished at that time. City and country suffered but most of all the greater towns with their narrow, sunless and ill-drained streets. Other countries suffered likewise. Petrarch, like his friend Boccaccio, an eye-witness of the Black Death in Italy, foresaw the inability of future generations even to imagine the magnitude of the disaster which came more nearly to extirpating mankind than any other evil that has been our lot. Rapidly in England and France, a full century later in Germany, but equally surely, the consequences followed. In England, owing to the death of half the peasants, wages rose 48 per cent. Then came the Statute of Laborers requiring men to work for pre-pestilence wages, passed by a Parliament, newly separated into Lords and Commons but both too ignorant of economic laws to realize the folly of their course. In 1381 the storm broke. And though the Peasants' Revolt was crushed, its aims succeeded. The old landowners were within a century largely replaced by a new yeoman and farmer class, who had first made their existence felt by their terrible long bows at the battle of Halidon Hill (1333). This rise of the yeomen by their military strength happened propitiously at the same time as the Flemish merchants of Ghent under Jacob van Artevelde formed an alliance with Edward III to protect the wool trade. Thenceforward in English history commoners were on equal terms with the hereditary nobles and this saved England in many a time of stress from disasters which have befallen less fortunate lands. It was in Ghent in 1340 that Edward assumed the fleur de lys and John of Gaunt, "time honored Lancaster," was born.

Another important feature of the times was the introduction of paper. Paper, it is true, has been known in Europe since the twelfth century, but now the Italians made it cheap enough to replace parchment and elm tree bark. There came the possibility of multiplying books and by gradual degrees wood blocks, which had been in use for over a century to ease the labors of the scrivener monks, replaced their handwork, though Europe had still to wait till 1446 for the introduction of movable type. So long as books were rare they were more venerated than read and thus that "authority" from which, ever since, we have been trying to escape, was fixed upon their authors. It was against this "authority" that Roger Bacon and Paracelsus strove, and Luther and many another. The minstrel disappeared in favor of the printer-publisher and the ballad singer. Classical languages gave place to the vernacular. People began to read and a new form of literature arose. In 1362 English replaced French as the language of the Courts. So quickly after the Black Death were profound changes taking place. Boccaccio introduced the short story in his "Decameron" and shortly afterwards Chaucer retold some of the tales for the benefit of English men and women weary of romances of the past.

This same Dan Chaucer, though a commoner, was brother-in-law to John of Gaunt. Upon an April day, he says, with summer coming on (the old calender was eleven days behind our modern one) the nine and twenty folk set out along the Pilgrim's way to Canterbury: the very perfect gentle Knight; the man of law who drew up deeds which none dare question; a nun's priest speaking French with a marked English accent; a pardoner with hair like yellow wax; the wife of Bath, a little deaf, with a bold handsome face which had already enticed five husbands into church; a gaunt and sober clerk of Oxford; and the rest, each telling stories to beguile the way.

We think of history in the terms of that phase which is usually written, one period is black with misery, another bright with hope. But just as today events both grave and gay mingle together to make life tolerable, so it has ever been. And Chaucer's pilgrims laughed and sang while the storm clouds gathered for the Peasants Revolt.

Into this time was born John Arderne (1307–*ca.*1390), physician to the Duke of Lancaster, a sound practical surgeon who taught that wounds should heal without suppuration, that dressings should be infrequent and applications as little irritating as possible. I mention these things specifically because we often fail to recognize how old and well known are the principles of medicine. John was an honest man with an open mind and often when he states his views, the paragraph ends with the simple sentence "nevertheless do another man as him thinketh better." He cut boldly for he was not afraid of bleeding, and to him is due the honor of invention of the operation for fistula which, after falling into disuse for nearly five hundred years, has again been accepted as correct treatment. There are many MSS. of his treatise ("De Arte Phisicali et de Cirurgia") for paper made this practicable. The granddaughter of John of Gaunt married Eric, king of united Norway and Sweden, in 1406 and the roll from which our picture is taken seems to have been sent to Stockholm for her guidance. Some careful soul had added a postscript on labor for aid to the young queen whose mother died when she was born.

The spread of knowledge possible through books, the spelling out of the black letter pages of the Bible, now printed in the vernacular, was to take long weary years before it was accompanied by that tolerance which alone makes wisdom possible. Calvin sent Servetus to the flames and Luther cried: "Let there be no pity.

It is the time of wrath, not of mercy. Princes can better merit heaven by bloodshed than by prayers." When we sigh for the unity of culture which gives so much of its charm to the Middle Ages we are all too apt to forget how that unity demanded as a means of success a tight stranglehold on men's minds and consciences. It was the common practice to express revulsion in public by the burning of the offending books. Intolerance and its expression must be understood if we are to have a glimmer of that great spirit of the medieval sunset, Paracelsus.

Born near Zurich in 1493; son of a physician from whom he had his early training in chemistry and medicine; a pupil of the abbot and alchemist Trithemus of Würzburg who thought it no evil to teach him occultism as well as chemistry, Paracelsus developed his strange, dominant and independent spirit. The unlovely portrait of him by Romeyn de Hooghe makes his sword the central theme for in its pommel he was supposed to carry a familiar spirit. In 1527 after many wanderings he was called to the chair of Physic in Basel and there he mortally offended the authorities by lecturing not in Latin but in German and by affixing to the blackboard of the University a programme of his lectures, inviting all to come. On the feast of Saint John, when the fairies are abroad and all the spirits banished by the Church come back for their one day's reprieve, he burned publicly Avicenna's "Canon." This revolt against authority was too much and Paracelsus had to flee. He died at Salzburg in 1541.

I suppose there will ever be two views of this restless, independent, fiery spirit. Denounced as a charlatan by some, upheld as an earnest seeker after truth by others, his worth can only be appreciated in the context of his time. And I confess I prefer the portrait by Tintoretto and the hero worship of Browning.

Even as I watch beside Thy tortured child
   Unconscious whose hot tears fall fast by him,
So doth Thy right hand guide us through the world
   Wherein we stumble.

The time allotted to me by our chairman has ticked itself away and I must make an end, but with this warning, that every physician, like Paracelsus, stands apart, receiving more than his due share alike of praise and blame. For to his fellows he comes like Knowledge to Everyman in the medieval play.

Everyman I will go with thee, and be thy guide,
In thy most need.

Endowed with powers beyond their grasp, stirred with a sympathy which is motive even more than emotion, interpreter of the unseen and of the dreams of men, comforter of the sick in body and soul, hope of the overburdened and overwrought, sheet anchor in distress and intercessor with the angel of death, how shall they judge him through that fierce light in which he has been placed. Within us all are primitive beliefs and old forgotten dreams ready to seize upon our consciousness. The spirit of the Middle Ages is with us still.

Make no more giants, God,
But elevate the race at once! We ask
To put forth just our strength, our human strength
All starting fairly, all equipped alike,
Gifted alike, all eagle-eyed, true-hearted,—
See if we cannot beat Thine angels yet.

MANUSCRIPT COPIES OF THE MEDICAL WORKS OF ISAAC JUDAEUS

THE DIPLOMA OF A JEWISH GRADUATE OF MEDICINE OF THE UNIVERSITY OF PADUA IN 1695*

By HARRY FRIEDENWALD, M.D.

BALTIMORE

THE manuscripts which I will present are works of a Jewish physician who was one of the Western lights of the Arabian period. His name was Abu Ya'kub Ishak ibn Suleiman al Israili, Isaac ben Solomon, Isaacus Judaeus, according to language used, Arabic, Hebrew, or Latin, in all of which languages his works obtained widespread fame. Among the Arabians he became so distinguished that he was generally known simply as Israili.[1] In English medical literature he is generally referred to as Isaac Israeli or Isaac Judaeus. In the early printed editions the author's name is given as Salomonis filius adoptivus, "Salomonis regis Arabum" and this is attributed to confusion with the Caliph for whom he composed the works.[2]

Isaac was born in Egypt before 850; various dates are given, the earliest 832. He studied the "Seven Sciences," including mathematics, astronomy and medicine. Said b. Ahmed b. Said, an Arabian scholar of Cordova, wrote of him that he "lived over one hundred years, never married, and did not seek wealth. He composed valuable works . . . which cannot be weighed with gold and silver."

In Egypt he became distinguished as an oculist. Hirsch[3] states that he was one of the most renowned of his time and cites his observations on ophthalmia and trachoma. Later he travelled to the then important city of Kairwan, about 50 miles south of Tunis; here he studied under Ishak ibn Amram of Bagdad and became Court Physician of the Aghlabite prince, Ziyadat Allah. When the latter was overthrown by the Fatimite Caliph Obaid Allah (the Mahdi, the Arabic Messiah who "became master of Northern Africa, of which Kairwan was the capital"), Israel entered his service. It is affirmed that it was at the behest of the Caliph that he "composed several medical works."[4] He had disciples, who became distinguished, Abu Yafar ibn al Yazzas[5] (a Mohammedan), and Dunash ibn Tamin (a Jew). He died in Kairwan; according to Steinschneider probably not before 950, the earliest probable date being 940.

If we take a glance at the development of Arabian medicine, we find that those physicians who were distinguished before Isaac's period were all of the East. They were Mesue (a Syrian Christian physician, 777–857), Hunain ben Honain or Johannitius (a Christian physician, 809–873), and Al Kindi (Alcuin, 813–880).

Jahia b. Serafiun (Serapion, the Elder, a Christian Syrian of the 9th century) and Rhazes of Persia (850–923) were contemporaries and were likewise Eastern. Isaac's teacher, Ishak ibn Amram, himself came from

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* Presented to the Section of Medical History, College of Physicians, Phila., Feb. 19, 1929.

Bagdad, and brought the medicine of the Orient to Northern Africa. Thus we find that Isaac Israeli was the first of the great names in the West.[6] The other great Arabic names are all of later date, Haly Abbas (? –994), Avicenna (980–1037), both Persians, and Albucasis, Avenzoar (1113–1162), Averroes (1126–1198), Maimonides (1135–1204), all born in Spain.

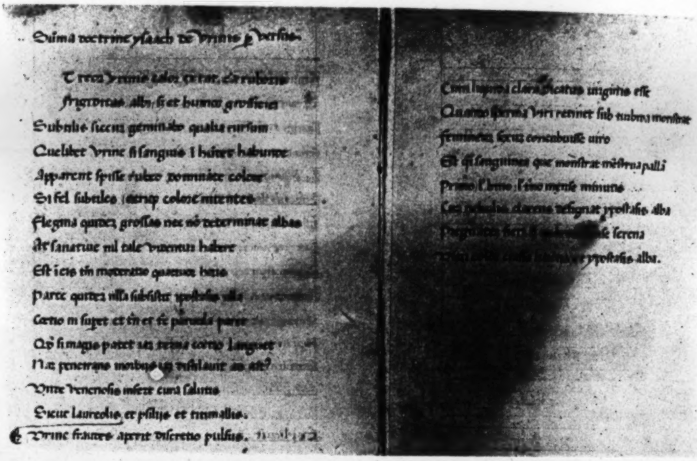

FIG. 1. VERSIFIED SUMMARY OF ISAACUS ON URINE; FOURTEENTH CENTURY MANUSCRIPT.

Isaac's works embrace philosophical and medical subjects. They were probably all written in Arabic, and subsequently translated into Hebrew, and into Latin. Those of his works dealing with philosophical subjects need not concern us here.[7] Maimonides showed no great respect for them, for in a letter to Samuel ibn Tibbon he declared that "Isaac was only a physician."[8]

The important medical works of Isaac are:

1. *Book on Foods and Simple Remedies*, in two parts: (a) in general, (b) in particular. Of the former there is an Arabic ms. in existence. There are several Hebrew mss. which vary in their text. Of the latter there is no Arabic ms. extant,[9] but one complete ms. in Hebrew is in Munich.[10] A Latin translation was made about 1070 by Constantine and versions were published at Padua in 1487, in Basle in 1570; the latter is a complete Latin translation, while the former contains only part b.[11] Sprengel[12] regards Isaac as the most excellent Arabian writer on dietetics. He says that his work "follows the form of Abenguefith and others, who wrote on dietetics and materia medica, but it contains much more extensive descriptions than those of any other Arabian writer."[13] It is not without interest and has a touch of the irony of fate that this work was the subject of a commentary by Petrus Hispanus, the physician who in 1276 became Pope John XXI. This commentary is contained in the "Omnia Opera" of Isaac.

2. *Book on Urine*[14] of which a number of Hebrew ms. are extent.[15] This book, like the other medical works was translated by Constantine. A new edition has recently been published by Peine.[16]

3. *Book on Fever.* This was the best known monograph. It was of this book that Isaac said when asked whether he would not be happy to have children live after him: "I shall leave my Book on Fever as my posterity." (Another version states that he mentioned also three other works, probably Elements, Foods and Urine.)[17] This work was twice translated into Hebrew and was translated into Latin by Constantine. Another Latin translation was printed in the "Collectio de Febribus" in Venice in 1576.[18] Singer in his recent "Short History of Medicine,"[19] like others before him, states that this was "the best account of the subject available in Europe during the entire middle ages."

4. *Book of Preparatory Instruction for the Physician.* Of this but one copy is known; it is in Hebrew. It was discovered in 1861 by Soave[20] and published in Italian. Another edition with German translation was published by Kaufmann[21] in 1885. It is made up of fifty paragraphs in the form of aphorisms, many of which show great wisdom.[22]

Other medical works have been attributed to Isaac. Thus a ms. on melancholy, which Steinschneider finds good reason to ascribe to his teacher, Ishak ibn Amram. Another on dropsy which Steinschneider says is part of the "Viaticum," and which he regards as the work of Isaac's pupil, Al-Djessar. The "Pantegni" was likewise attributed "to Isaac rather than to Haly Abbas," which "is almost certainly a falsification of Constantine."[23]

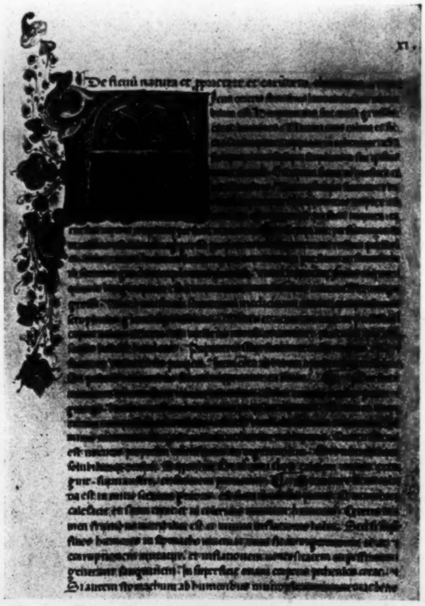

FIG. 2. FIRST PAGE OF SECOND BOOK FROM "OPUSCULI PARTICULARUM DIETARUM LIBRI TRES," FOURTEENTH CENTURY MANUSCRIPT.

The translator of the medical writings of Isaac into Latin, as mentioned above, was Constantinus Africanus (*ca.* 1020–87), "the first Latinizer of Arabic culture." Cumston[24] makes the statement "that he took special pains to eliminate in his translations anything that might identify the original book. He eliminates all proper names which are too Oriental and substitutes his own name in order to prevent, he says, "any other writer from stealing the fruit of his work." Campbell deals more mildly with him. He says that he "failed to quote his sources and though his Latin was defective, a century later his writings revived the study of Hippocrates and Galen in Europe. Even after the two Gerards in Toledo had produced their more accurate translations, his versions continued to be read as authoritative and standard works."[25] It must, however, not be overlooked that we owe much to Constantine, for he was the first to popularize Arabian medicine in Europe; he is the earliest of those translators from Arabic whose name has been preserved. His Latin translations were received like a revelation. He brought them to Salerno from which center their influence spread. On the other hand, the Hebrew versions likewise enjoyed much popularity among Jewish physicians of Italy, France, and Spain.

Roger Bacon, about 1268, mentions among "Medical authorities . . . Hippocrates, Galen, Constantine, Rhazes, Haly, Isaac, and similarly experienced physicians."[26] It is, therefore, not surprising to learn that "at Oxford and other principal medieval universities the medical Curriculum . . . included the Tegni of Galen, the Liber Febri of Isaac Judaeus, the antidotarium of Nicholas of Salerno, and the Aphorisms of Hippocrates."[27] In the middle of the 13th century the Faculty of Medicine of Paris put the stamp of their approval upon the following list of books for study by the medical students: At the head of the list were the Aphorisms, the Prognostics, and the Acute Maladies of Hippocrates; then followed Johannitius' (Honain) Introduction to Galen, Theophilus' Anatomy based on Galen, the same author's book on Urine, Philaretus[28] on the Pulse, Giles de Corbeille's Treatise on Urine in Verse, as also his Signs of the Pulse, and finally also the medical works of Isaac.[29] The latest student of Arabian Medicine, Campbell, declares that Isaac justifiably enjoyed great fame in North Africa and exercised no little influence upon the Medicine of the Middle Ages.[30] In this view he follows Neuburger and others. An interesting confirmation of this view is to be seen in the well-known illustration in the Venice edition of Ketham of 1522 showing Petrus de Montagna in his library and consulting room. Among the twelve books with titles shown, we see Isaacus as though just used, lying on the table!

The printed editions of Isaac's medical works are as follows:

(a) Eximii Isaac medicine monarce. De particularibus dietis libellus, Padua, 1487.

Copies of this edition are in the libraries of the College of Physicians, Philadelphia; of the Surgeon-General, Washington; and of the Jewish Theological Seminary, New York.

(b) Omnia opera ysaac in hoc volumine contenta quibusdam aliis opusculis. De definitionibus, de elementis, liber diaetarum univ. cum commento Petri Hispani, de urinis, de febribus, Pantechni decem libri theorices et decem pract. cum tractatu de gradibus medicinarum Constantini, viaticum Ysaac, de oculis, de stomacho, liber virtutum de simplici medicina, compendium megatechni Galeni a Constantino compositum. Lyons, 1515.

Copies are in the Library of the Surgeon-General and likewise in the Library of the Jewish Theological Seminary, New York.

(c) Isaaci Judaei de diaetis universalib. et particularib. Basle, 1570.

A copy is in the possession of the writer.

(d) De febribus liber. Opus sane aureum, non magis utile, quam rei medicae profitentibus necessarium; in quo trium sectarum; clarissimi medici habentur, qui de hac re egerunt; nempe Graeci, Arabes, atque Latini, quorum nomina versa pagina indicabit. Venetiis, 1576.

A copy of this work is at the Surgeon General's Library.

(e) Synesium, de Febribus (autore

> Ishak ibn Sulaiman al Israeli, interprete Constantino Africano), quem nunc primum e condice mo. Bibliothecae lugdunobatavae edidit, vertit, notisque inlustravit Jo. Steph. Bernard. Accedit viatici (autore Ishak ibn Sulaiman al Israeli) Constantino Africano interprete lib. VII paro. Amstelodami, 1749.

This work is listed in the Catalogue of the Bibliothéque Nationale of Paris.[31]

We are especially interested in three Latin manuscript copies of Isaac's works, in the library of the writer:

The first is a versified summary of his book on urine. It is written on heavy paper and is probably of the 14th century. It is bound in with a similar and much longer summary of Giles de Corbeil's work on the same subject. Isaac's part is comprised in twenty-four lines entitled Suma Doctrine Ysaach de Urinis p. versus (See Fig. 1).

The next ms. is a 14th century copy of the Diet which I obtained a few years ago from Davis and Orioli of London. Their catalogue description was as follows:

> Opusculi particularum dietarum libri tres. Ms. on 63 leaves of vellum, folio (12¾ by 8⅝ ins.) of Italian origin, 14th century, very neatly and clearly written in red and black Gothic characters, 35 long lines to a full page. Large initial A in gold and colours on leaf 11, with finely executed marginal flowery ornaments. Three similar (but smaller) initials in the body of book, and hundreds of lesser ones throughout. The scribe has written his name at end: "Petrus Burdegalensis exarauit." The first leaf (title) missing, otherwise a most beautiful ms. of this important work. (See Fig. 2.)

The ms. has recently been rebound by Zaehnsdorf of London. The description just given is very modest, for the book is exquisite. Indeed, it is this that explains the absence of the first leaf which was probably taken by a vandal for its illumination.

The last is a ms. which I have obtained recently. It is a small volume which contains eleven books, a collection known in the Middle Ages as the "Ars Medicinae," and since the 15th century as the "Articella" (an Italian diminutive of Arte and a translation of the Greek-Latin Microtechnon). The "Articella" dates back to Constantine of Africa.[23]

I obtained this beautiful manuscript from the well-known antiquarian, Jacques Rosenthal of Munich. It is described in his catalogue Bibliotheca Medii Aevi Manuscripta, pars altera (Katalog No. 90) from which the following is translated and abbreviated:

> It is a 13th century parchment ms. from the French Provence written in small, peculiar, scholarly, miniscule letters, in two uniform columns divided by red and blue rubrics, with red-blue page titles, numerous initials in two colors, and ornamented on the borders with grotesque forms of fishes and birds and ten large illuminated initials in gold on colored background and one picture initial in colors on a gold background (teacher and two pupils). 171 leaves, small folio 237 × 170 mm., bound in wooden covers in red velvet. On the front cover there are engraved brass corners with mother of pearl buttons. (French binding at the latest of the 15th century.)

The first seven tractates covering in all 38 leaves are the following:

(1) Johannitius, Isagoge ad tegni Galieni ("a short systematic survey of medicine"). Page titles L JO (Liber Johannitius).

(2) Hippocrates, Aphorismorum particulaese septem. Page titles L A (Liber Aphorism).

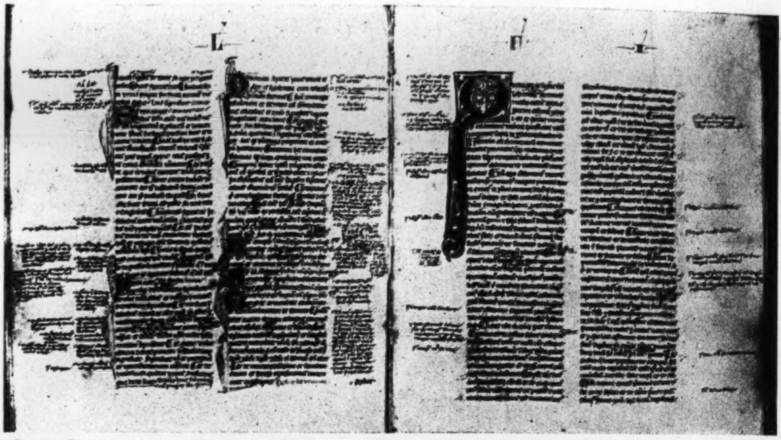

Fig. 3. Last Page of the Book on Urine of Theophilus and First Page of the Book on Fever from the "Articella," Thirteenth Century Manuscript, with Extensive Marginal Notes.

(3) Hippocrates Liber prognosticorum. Page titles L P (Liber Prognosticorum).

(4) Hippocrates De regimini acutorum libri tres. Page titles L R A (Liber regimini acutorum).

(5) Galienus Liber tegni (ars parva). Page titles L T G (Liber tegni Galieni).

(6) Philaretus Liber pulsibus. Page titles L PL (Liber Philareti).

(7) Theophilus Liber urinarum. Page titles L U T (Liber urinarum Theophili).

The remaining four books are all the works of Isaac Judaeus. They begin on leaf 39 r and end on leaf 1 71 v, or more than three-fourths of the whole volume. Their description will be given in greater detail.

(8) Libri febrium quinque covering forty eight leaves. Page titles L F I–V. Index of chapters (as in the edition of the Opera Ysaac, Lyons 1515) before the books II–V. This and the following three works translated by Constantine are generally found united both in the articella and otherwise, as they were likewise in their Arabic versions. They were replaced in the printed editions of the articella by other works. (See Fig. 3.)

(9) Liber de urinis, 19 leaves. Page titles L U Y. In the prologue, as in that of No. 8, Constantine speaks of himself as the translator.

(10) De diaetis universalibus, 47 leaves. Page titles L D U.

(11) De diaetis particularibus, 17 leaves. Page titles L D P. Divided in three principal parts headed by capitals. The book ends with the chapter de vino, the last six chapters are wanting.

When I ponder over these books, the author of which lived a thousand years ago, I feel that he spoke prophetically when he said that his books would be his enduring posterity.

THE DIPLOMA OF A JEWISH GRADUATE OF MEDICINE OF THE UNIVERSITY OF PADUA, 1695.

A few years ago I secured the following item from Maggs of London: "Original Diploma of a Doctor of Medicine, 'Copilius Pictor Hebraeus, D. Josephi Filius,' native of Bingen-on-the-Rhine, dated 30th December 1695. Written on vellum, with two pages richly ornamented in gold and colours, and a portrait of the candidate in colours on the reverse of the first page [see Fig. 4]. 4to. Italian binding beautifully tooled in gold to an elaborate fan design on both covers."

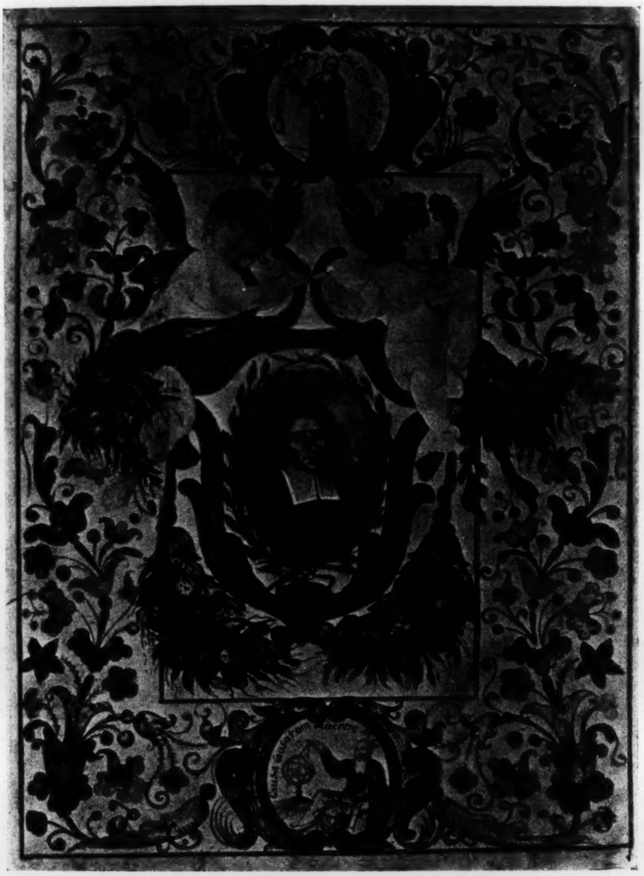

FIG. 4. FIRST PAGE OF PICTOR'S DIPLOMA.

Through the kindness of my friend, Prof. Alexander Marx of New York, I obtained all available information about the recipient of the diploma,[33] whose Latinized name, Copilius Pictor, was the translation of his common name Koppel (a Jewish diminutive of Jacob) Mehler or Maler. Doctor Marx found that this diploma had been briefly described by Ignaz Schwarz of Vienna.[34]

Jacob Mehler was a member of a distinguished and learned family. His great grandfather, Samuel, was an officer of the Jewish community of Bingen; his grandfather, Judah (1609–1659), was Rabbi of Bingen;[35] his father, Joseph (? –1676), was treasurer of the community; his brother, Judah II (1660–1751), became Chief Rabbi of Westphalia and the Rhine District and one of the most learned Talmudic authorities of his time.[36] His grandson, Gomprich, was Rabbi of Bingen and died there in 1808. Jacob, or Koppel, the brother of Rabbi Judah II was married and had a daughter but no son. We know nothing about his student years except that he graduated in 1695 in Padua. He was, therefore, a classmate of Richard Mead. He practised his profession in Bingen and also served as an officer of the Jewish community and he died there in 1720.

Padua was the University of Italy which during a long period attracted Jewish students. The relation of the University to the Jews was studied by Ciscato[37] who published the "Constitutionum Sacri Patavani Collegii Philosophorum et Medicorum: De Hebraeis non promovendis, Stat III" in which it was decreed "that the Jews shall not in any manner be admitted to the 'primatus' or public examination, and may not be given the doctorate or have the insignia of any other dignity, or obtain from the Sacred College any authorization whatsoever to practise medicine. And this injunction we mean to be so fixed and immutable that except on unanimous vote, it may not be abolished even once or be annulled in the slightest particular." Ciscato does not give the date when this article was adopted, and an examination kindly made by Professor Benvenuto Terracini of Padua shows that the document from which the published copy was made is without date. We may mention that "the twenty-fourth canon of the Council of Basle on September 7, 1434, distinctly forbade Jews from taking any academical degree."[38]

In spite of these severe decrees, we find that "a great many Jews, some from distant countries, entered the University. During the period from 1517 to 1619 eighty Jewish students, and from 1619 to 1721 as many as 149, obtained the degree of doctor of medicine . . . Jewish graduates were exempted from wearing the 'Jews' hat."[39]

> Jewish students met with great difficulties in obtaining the degree of doctor. It was the bishop, presiding as chancellor of the University who bestowed the diploma of the "Sacred College," either in his palace or in the church. The ceremonies, therefore, had a religious character; German Protestants and Orthodox Greeks not infrequently declined rather than recite the Catholic articles of faith. It, therefore, became necessary to make an exception in the case of non-Catholics and to grant them diplomas through intermediary non-clerical officials and later through the Venetian College ("Collegium Venetum"), specially founded for this purpose.
>
> After receiving his diploma, the Jewish graduate was in duty bound to present the inspector of the University with thirty-five packets of sweet-meats to be distributed among the various national student bodies, or nations as they were called. This, as well as other expenses entailed in obtaining a diploma, was an intolerable burden on students of small means . . . It is stated that Jewish students formed a student body of their own."[40]

Rashdall informs us that "Padua as early as 1409 was liberal enough to bestow its Medical Doctorate on a Jew."[41] Padua was indeed exceptional in its attitude.

Special papal dispensation was certainly required in some cases, if not generally. Ciscato published a letter of Pope Julius III dated January 9, 1555, in which he directs the University of Padua to examine one Jewish student and if found satisfactory, to grant him his degree.[42]

The form of Pictor's diploma is quite similar to that of Richard

Mead; but Mead's diploma is dated August 26, 1695, while Pictor's diploma is dated December 30 of the same year. The signers of Mead's diploma were Count Carolus Renaldinus, Francisco Besenella, Pro-Syndic, Jacobus Viscardi, and Count Alexander Bonomeus. Michael Angelus Molinetus with Besenella and Viscardi were the signers of Pictor's diploma.

There is an interesting difference between these diplomas. While Mead's, like Harvey's and others, begins with the invocation "In Christi Nomine Amen," Pictor's begins with the words: "In Nomine Dei aeterni." This was evidently done in consideration of the fact that Pictor was a Jew. Near the end of Pictor's diploma we find the date given as "currente anno MDCLXXXV." Harvey's is dated "Anno a partu Virginis MDCII" and Mead's "Anno a Christi Nativitate;" another medical diploma of Padua of 1700 has the same formula.[43] I have found the record of another Jewish graduate of 1589, L'Ebreo Solomon Lozzi, which begins with the same invocation as does Pictor's, but the date is given as "a anno Virgini partus," etc.[44] One is forced to the conclusion that in making these changes from the prescribed form, the University showed a degree of consideration far beyond what we would expect.

The diploma of Harvey states that it was "done and delivered" "in Palazza nostre" (of the Palatine Count Sigismund). In Gualleri's diploma, we read "in Episcopali Palatio in loco solito examinatum;" "in the usual place." In both Mead's and Pictor's diplomas, we find only the words "in loco solito examinatum Academie Patauiane," in the usual place at the University of Padua. It would appear that this was done because Pictor was a Jew and Mead was a member of the Anglican Church. The ceremony was probably performed under the authority of the "Collegium Venetum" already referred to. Payne states that:

> It seems that the Emperors granted to Counts Palatine the right to create Masters and Doctors; it is to be presumed, with the concurrence of a University, though this is not mentioned. There is evidence that this right was admitted except as to degrees in theology. Hence it was as Count Palatine, i.e., Comes Sacri Palatii, that Sigismund claimed the powers he exercised. I have found records of one other degree, at least, conferred in his palace. In the later Paduan diplomas I find no mention of any person of like style and dignity. The presiding authority is generally either an ecclesiastic or some specially important professor acting under the authority of Venice. There is no mention in the Diploma of the Pope or any ecclesiastic, nor is there any testimonial of orthodoxy or confession of Faith, such as I have seen in diplomas from Bologna and other universities; an omission which shows the tolerant and liberal spirit characteristic of Padua.

This view is in accord with that which we were led to express here.

Payne calls attention to the witnesses named in Harvey's diploma and says: "We find that it was usual on these occasions to invite some of the graduates own countrymen . . ." Among the witnesses mentioned in Pictor's diploma are "Sabbatheus Marini, a Hebrew doctor of philosophy and medicine of Padua, Doctor Simon Mischita, a Hebrew of Venice."

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5. Steinschneider (*Op. cit.*) gives the name as abu Djaafar Ahmed ben Ibrahim ibn al-Djezzar; he died in 1004, over eighty years of age.
6. It is interesting that Rhazes and Isaac were born about the same time, though the latter outlived the former by a quarter of a century.
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30. Campbell. Arabian Medicine. 1: 74.
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Leipzig, p. 247; Sarton's Introduction to the History of Science, 1: 639–40; and especially to Steinschneider's studies, for he was a most profound student of Isaac's works. The references to his studies are as follows: (a) Hebraeischen Uebersetzungen des Mittelalters und die Juden als Dolmetscher, Berlin, 1893; (b) Introduction to Arabic Literature, *Jew. Quart. Rev.*, 13: 95; (c) Die Europaeischen Uebersetzungen aus dem Arabischen bis Mitte des 17 Jahrhunderts, Part I (From Sitzungsberichte der Kais. Akademie der Wissenschaften in Wien, 149: 11, 23.

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HIERONYMUS BRUNSCHWIG OF STRASSBURG

By ALEXANDER BRUNSCHWIG, M.D.

CHICAGO

GERMANY played a very minor rôle in the advancement of surgery during the 15th and early 16th centuries. It was in Italy and France that its progress was made during this epoch. Medical education comparable to that offered in the great French and Italian centers could not be had in Germany. Here the formal teaching of medicine began only in 1550 with the establishment of a chair of medicine in Heidelberg. A professorship of surgery existed in Würtzberg in 1587. These opportunities were of course extremely limited and very unsatisfactory. For those desirous of becoming surgeons the only path open was to serve an apprenticeship to a barber-surgeon and then to rely on one's native ability to profit from experience in military and civil practice.

In spite of these seemingly backward conditions, there were at this time several German surgeons who stood out from the great mass of their colleagues. Among these were Heinrich von Pfalzpeunt, Johann Schenck, Johannes Beris, Hans von Gersdorff, Hans Meyer and Hieronymus Brunschwig. They were very practical surgeons, essentially self-educated and endowed with a great desire to teach their art and to raise its standards from the low level to which it had fallen in their land. Their writings, filled with quaint and superstitious beliefs and containing accounts of their varied and extensive experiences, form the beginning of German surgical literature.

Hieronymus Brunschwig was the most outstanding figure in this group and occupies a definite and important position in the general history of surgery. He was born in Strassburg about 1450, and, some state, lived to be one hundred ten years of age. More probable, however, is the belief that he died in 1533 at the age of eighty-three.

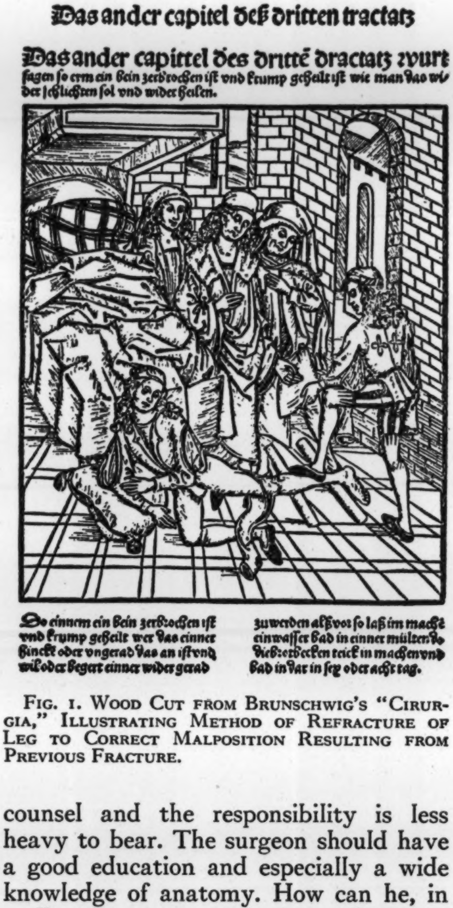
Little is known of the details of Brunschwig's life. The principal sources for this information are his own writings, throughout which are related numerous personal incidents. At the early age of ten he became deeply interested in surgery, and no doubt began his apprenticeship when still very young. Upon becoming a master barber-surgeon he began to travel throughout western Germany and practiced his profession in many towns and cities. Whether he actually travelled into Italy and France, as some maintain, has not yet been definitely determined; nor is it clear to what extent he followed the armies as a military surgeon. Certain it is, however, that he always considered himself a citizen of Strassburg and always made this town his headquarters.

If little is known of his life, through his writings we are quite familiar with his character. He was primarily a man of the people, honest and modest. His main interests were to help the sick and to publish treatises on surgery and pharmacology for the benefit of his less experienced colleagues. He also wrote medical guides for the layman. His relations with his colleagues were apparently always most cordial and in his writings he does not hesitate to quote them frequently. A product of the apprentice system, he developed himself to a far higher plane than was attained by most German barber surgeons of his time. He was acquainted with all the medical classics of the ancients and moderns of the day. These he probably read in German translations, as he unhesitatingly admits that his knowledge of Latin was very deficient. The extent of his reading may be judged by his own statement that he had studied 3000 volumes. He had great reverence for the knowledge of the ancients, whom he believed to possess far more medical and surgical lore than was known in his own day. However, when his observations conflicted with those of the old authorities he did not hesitate to criticize them.

As proof of his religious conscience may be cited the dedication of his "Cirurgia" to "God the almighty and His 'wirdigen' Mother Mary." He also had a strong sense of ethics, as shown by his careful instructions (Cirurgia) to surgeons regarding the evaluation in terms of money of disabilities incurred accidentally by craftsmen in their work.

In the introduction to the "Cirurgia" he sets forth the qualities that those who practice surgery should possess and the ideals toward which they should strive. He states:

> The surgeon should not only possess the physical requirements necessary for the practice of a difficult art, but his mode of living must be beyond reproach. He should respect the physicians and priests, conduct himself with tact toward his patients—not to startle them by the bitter truth but inform the family. He does not become covetous, and above all he must be modest. There is no disgrace in calling upon a colleague for consultation in a difficult case, he may give good counsel and the responsibility is less heavy to bear. The surgeon should have a good education and especially a wide knowledge of anatomy. How can he, in reality, amputate, cauterize, reduce luxations, extract foreign bodies if he does not have a perfect knowledge of the human body?



Das ander capitel deß dritten tractatz

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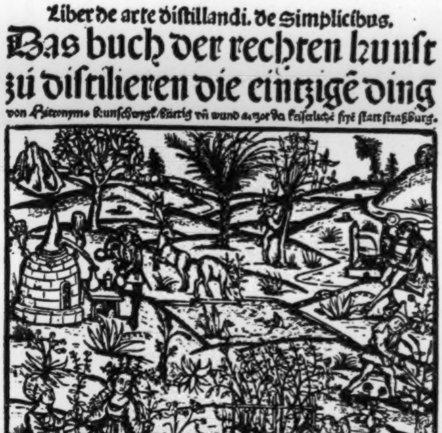
So einnem ein bein zerbrochen iſt vnd krump geheilt wer das einner hinckt oder vngerad das an iſt vnd wil oder begert einner wider gerad zu werden alß vor ſo laß im machẽ ein waſſer bad in einner mülter. So die brotbecken teick in machen vnd bad in dar in ſey oder acht tag.

FIG. 1. WOOD CUT FROM BRUNSCHWIG'S "CIRURGIA," ILLUSTRATING METHOD OF REFRACTURE OF LEG TO CORRECT MALPOSITION RESULTING FROM PREVIOUS FRACTURE.

As was the case with all general surgeons of his time, Brunschwig was concerned only with the surgery of wounds, fractures and luxations. In addition, he was greatly interested in drug therapy, especially as applied to surgical conditions, and, as will be related below, was the author of several treatises on pharmacology.

The most important of Brunschwig's literary contributions is the "Cirurgia," published July 4, 1497, in Strassburg by Grüninger. This was the first important printed surgical treatise in German. It contains two hundred and sixty pages with an appended compend of anatomy of eleven pages. The "Cirurgia" is written in Alsatian dialect of the 15th century, but was no doubt easily read by anyone whose mother tongue was German. The style is simple, direct and emphatic. The author addresses the reader in the second person, and prefixes directions for treatment of a given condition by the familiar "du solst" or "du must." The treatise is in a large measure a compilation of the ancient and medieval authorities but the author's own extensive experience forms the real basis of the work. The "Cirurgia" is not a scientific treatise nor was it intended to be one. It was written for the apprentices, "the future masters and their servants the barbers and surgeons" and for "when the surgeon living in lonely villages and castles far away from all aid has to fall back on his own resources." The book treats primarily of wounds, fractures, dislocations and drug therapy to be administered under these conditions. Amputations are the only major procedures described. Lithotomy, herniotomy, etc. are left to "Specialists" in these fields.



Liber de arte diſtillandi. de Simplicibus.
Das buch der rechten kunſt
zů diſtilieren die eintzigē ding
von Hieronymo Brunſchwygk/bürtig vñ wund arzot der keiſerlichē fryē ſtatt ſtraßburg.

FIG. 2. TITLE PAGE FROM BRUNSCHWIG'S "DE SIMPLICIBUS." ILLUSTRATION SHOWS VARIETY OF MEDICINAL PLANTS BEING COLLECTED AND DISTILLED.

Certain features of the work are interesting from the standpoint of medical history:

On pages 37 and 38 various methods for hemostasis are enumerated. The searing iron and styptics are of course mentioned, but ligation by means of the transfixing suture is also described. This procedure Brunschwig no doubt practiced (fifty years before Paré).

On page 50 a complicated prescription for a narcotic potion is given. Deadly night shade, henbane, poppy and mandragora are the main ingredients.

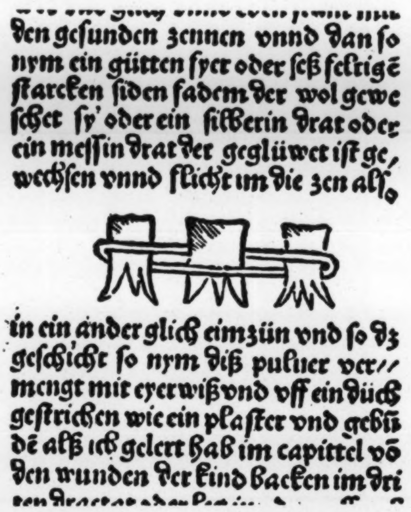
The article on gunshot wounds is found on page 57. This is the first detailed account on this subject ever written in any language. Gunshot wounds are considered to be poisoned and their purification is to be promoted by causing suppuration with the seton. Bullets should be removed, but they may in some cases remain in the tissues. Theriac is recommended for internal administration in these patients. As Sigerist points out, this chapter is strong proof that Brunschwig was no military surgeon, as has been often maintained. For he does not here discuss a single case from his own experience but names all of his authorities, principally Hans Ulrich of Baden.

On page 60 we find this interesting statement: "Die alten sagen es gibt Keine gute Wundverklebung wenn nicht ein Reinigunsmittel dabei augewendet wird."

On page 195 there is illustrated a method of reinforcing a loosened tooth by means of a twisted loop of silver wire, a humble forebearer of modern "bridge-work."

The wood cut illustrations are one of the outstanding features of the "Cirurgia." The artist has until the present day remained unknown. They comprise eighteen different cuts but are reproduced more than once and some in combination with one another, thus making the total number of illustrations forty-eight. On the title page there is the traditional Wundenmann, the nude figure of a man exhibiting various types of wounds in the arms, legs, trunk and head. In most of the illustrations the physician or surgeon, accompanied by assistants and students, is represented on one side of the picture, while the patient on the other side is seen lying in bed or sitting up exhibiting his wounds. These illustrations are primarily decorative and must have been little instructive for the 15th century reader. Today, however, they serve as valuable texts for depicting the costumes and interior decorations of that period. The "Cirurgia" underwent five editions, the last appearing in 1539. It was translated into Dutch and from this into English.

Brunschwig's great interest in pharmacology has already been mentioned. He wrote two treatises on the subject known as "De simplicibus" and "De compositis." These two books, sometimes published together, underwent fourteen editions between the years 1500 and 1597. These works, he states, were written because he had "often been questioned in his practice how one was to distill, use and reserve waters." The works are richly illustrated and contain numerous descriptions of medicinal plants and directions for preparation of various drugs from them. The books were written primarily for the layman's use. Waters recommended for acquiring a retentive memory, to affect dreams, to foster conjugal unity etc. are described.



den geſunden zennen vnnd dan ſo
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FIG. 3. WOOD CUT FROM BRUNSCHWIG'S "CIRURGIA," SHOWING METHOD OF REINFORCING LOOSE TOOTH BY LOOP OF SILVER WIRE ATTACHED TO SOUND TEETH ON EACH SIDE.

Brunschwig's third work was the "Pestschrift," which appeared in 1500.

Its full title is "Liber pestilentialis de venenis epidemie." Brunschwig lived through the plague of 1473 and his experiences during its terrors form the basis for this treatise. He describes the frightful suffering and mortality endured by the population. He relates in great length how the physicians deserted their patients while the surgeons remained at their own great risk to minister to those suffering from the scourge. Of special interest in connection with this work is the fact that it contains the first reference to the "male francose oder malum mortem" (syphilis) found in German literature.

Another book by Brunschwig is the "Hausapoteck," a general medical treatise written expressly for the layman's use. Its popularity is evidenced by the fact that it underwent seven editions, five of which were published after his death. In 1509 there also appeared a "Regimen sanitatis salernitanum Brunschwyg." (Sudhoff.)

At an advanced age Brunschwig still aspired to write a book on synonyms and to a complete revision of his "Cirurgia." Death overtook him, however, before either of these projects was realized.

Ambroise Paré, coming only a few years later, greatly overshadows all others of his epoch. Brunschwig's accomplishments are but a feeble candlelight compared to the shining sun of the achievements of the great French surgeon. Sigerist, however, summarizes his life and work as follows: "Brunschwig was no genius. His name is not coupled with any new discovery. He took no part in the great rise of surgery during the 16th century. He is a man of the Middle Ages, not of the Renaissance. If, in spite of this, he is still able to claim an honourable place in the history of medicine, it is because, at a time when German surgery was in a very backward state, he far surpassed his contemporaries by his intelligence, his talent and his education, and because he presented his fellow countrymen with a manual through which they were enabled to share in the progress made by other peoples. But it is also because Brunschwig was a most lovable personality. As a modest, honest, upright man, gifted with a keen sense of humor, he lives in history."

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THE ORIGINS AND SIGNIFICANCE OF THE PUBLIC HEALTH MOVEMENT IN THE UNITED STATES

By RICHARD H. SHRYOCK, PH.D.

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THE early settlers of the American colonies brought with them, as a part of their biological heritage, the then common European diseases;[1] a simple fact which was to give them more concern, in the long run, than even Holy Writ or the rights of Englishmen. They also brought with them, as a part of their cultural heritage, the prevailing European medicine and hygiene. Since these sciences, however, were still partly medieval in character,[2] it is not strange that early colonial medicine was bizarre and ineffective;[3] nor that public hygiene, apart from quarantine regulations, was practically non-existent.[4] There was still more confidence in theological prophylaxis than in any other form.[5] The unfortunate results of this situation became more obvious as the population increased through the 18th century, especially when spectacular epidemics of smallpox and yellow fever terrified the towns.[6]

Meanwhile, scientific progress in Europe resulted, during the 18th century, in a growing and more intelligent literature on hygiene, nearly nineteen hundred books and essays having been printed on the subject in Europe by 1800;[7] in the first recognition that public health represented a special aspect of that field, of peculiar concern to the state;[8] and in the successful adoption in Europe and America of the first modern achievements in preventive medicine, viz., inoculation and vaccination against smallpox.[9] In the same century, the so-called "humanitarian" spirit arose, notably in France and the British Empire, as a result of complex forces which need not be entered into here. This spirit led various idealists, like Howard and Rousseau, to advocate social amelioration through the prevention of disease,[10] which seemed so often to be the chief factor in human misery.[11]

Such reformers, however, were not generally heeded, until their appeals could be made to the self-interest of influential classes. This became possible when, after about 1830, cholera and yellow fever, both of which displayed a strange lack of respect for one's station in society, swept Europe and America and frightened the authorities into action.[12] The chief European governments now followed the pioneer example set by Prussia, in the preceding century,[13] by establishing local and national institutions for the prevention and control of disease.[14]

This activity was particularly noticeable in Great Britain, where the relatively rapid development of urban industrialism made social misery peculiarly obvious.[15] During the half-century between 1790 and 1840, it became increasingly apparent that industrialism had made more difficult the age-old problem of public health;[16] and that at least a partial solution was essential to a further development of urban civilization. Improvements in transportation and consequent commercial expansion had also complicated matters, especially with relation to the spread of contagion. (Cholera, e.g., which was a great traveler, usually followed an itinerary predetermined by commercial routes.) National surveys in Britain revealed, during the forties, an appalling loss by preventable disease;[17] and, as a result, the British Government established by 1848 the most effective local and national sanitary institutions which modern society had yet devised.[18] Related as both cause and effect to this governmental action, and arising from the same circumstances, was a popular health reform movement; which expressed itself, as such movements will in democratic states, in the organization of societies and the publication of journals. All these phases of British activity made a marked impression upon contemporary American observers; to such an extent, indeed, that the British health movement operated as one of the chief causes of subsequent American sanitary reform.[19]

The second quarter of the 19th century found industrial and commercial urbanization under way in parts of the United States, as in Great Britain; with social need becoming more obvious here also, as population became more concentrated, and urban mortality rates rose in alarming fashion.[20] Humanitarianism, both home-made and imported, was rampant throughout the land. Then came the same types of epidemics which had visited the "old-countries;" and here, as abroad, authorities and public were from time to time terrified into being good, and doing somewhat as the reformers desired.[21]

A few permanent, local health boards were established in American towns between 1790 and 1830 (chiefly in the ports for the administration of quarantines), but under the benign influence of epidemics, the number increased steadily after the latter date.[22] During the eighteenth century, the largest towns began to depend upon their sextons for the imperfect recording of death rates; and, after about 1830, to secure from physicians the birth and morbidity statistics. These data, so essential to sanitary reform, were more reliably reported after 1850, partly as a result of the stimulating influence of Farr's remarkable reports in England.[23] By 1860, the majority of large American towns possessed health boards, a fair number of which were conceded real administrative as well as advisory functions, with relation to quarantine and sanitation.[24] There were practically no full-time, salaried medical officers acting for these boards, however, until after 1870; save for the quarantine officials, and these latter were usually political henchmen.

No real state boards of health were instituted until after the Civil War; although Lemuel Shattuck's famous report, submitted to the State of Massachusetts, clearly recommended such a board as early as 1850.[25] Nor did early efforts to persuade the state governments to collect vital statistics succeed; the enlightened American legislature of this period being inclined to view mortality registration as some subtle trick of the doctors. The nature of our federal government, moreover, discouraged the creation of a national health office, or even a central administration of maritime quarantines, during the antebellum years. The only federal health work organized, apart from the Army and Navy medical departments, was that of a somewhat indifferent Marine Hospital Service.

This organization, curiously enough, devoted itself largely to caring for the mariners of the Mississippi Valley.[26]

More was left to the energy of unofficial organization, therefore, than was the case in any of the chief European nations. This meant delay in the setting up of administrative machinery for the prevention of disease in the United States. In the first place, it rendered difficult that investigation of disease conditions, which must necessarily precede any intelligent attempt at administrative reform.

A few efforts were made by individuals in the early forties, perhaps as a result of concomitant British action, to prepare sanitary surveys of the largest American cities. More significant was the action of the American Medical Association which, immediately after its organization in 1847,[27] prepared a series of reports on the sanitary condition of some dozen American towns, and upon desirable improvements in the same.[28] These and subsequent reports indicated that just such filth, disease, and general depravity, as had recently been revealed in the slums of London and Glasgow, were also common to those of Boston and New York; that high morbidity rates, chiefly due to respiratory and contagious diseases, obtained in the larger cities; and that the consequent death rate (due chiefly to infant mortality) was even higher than that of contemporary British and French municipalities. The American Medical Association, however, did not follow up these investigations. It was composed of the representatives of medical schools and societies, whose interests were naturally centered in the technical and professional aspects of their science, rather than in its social implications. Doubtless as a consequence of this, the Association's interest in public hygiene failed to develop during the fifties;[29] and its place in the evolution here traced was consequently taken by a new and hitherto unheard-of type of organization.

In 1856, the Philadelphia Board of Health, influenced by an earlier international sanitary conference held at Paris, invited similar boards and other municipal bodies throughout the Union to organize a sanitary convention. The American states, it was pointed out, were still to all intents and purposes independent nations, so far as health codes were concerned. Had not the time come when they should hold their own international sanitary conference? The immediate occasion of this call was a growing dissatisfaction with both the questionable severity, and the unquestioned confusion obtaining in the state quarantine laws.[30] When the first convention assembled in 1857, however, it soon became apparent that the general problems of "internal" disease prevention transcended in importance the specific matter of "external" quarantines.

Most of the delegates came from the Atlantic and Gulf ports, and included municipal officials of all kinds, as well as socially minded medical men. The first meeting at Philadelphia was succeeded by others in 1858, 1859, and 1860, held, respectively, at Baltimore, New York, and Boston. The members came to look upon the assemblies as those of a permanent institution,[31] and so it would in all likelihood have become, had not the tragedy of the Civil

War intervened. Despite this untimely end, the conventions operated, in a very definite sense, as the first American public health association; and their leaders were convinced that they had inaugurated a new era in American social history.[32]

The chief actual accomplishments of this early Association were the adoption of standard quarantine regulations, of a suprisingly comprehensive urban sanitary code, of pure food and drug regulations, and of a public health law providing for a state board,[33] all of which were urged upon the several states for adoption. Thus they strove to promote sanitary progress and, at the same time, to overcome the handicaps incidental to a federal form of government.[34]

The Association also encouraged the development of a popular health movement, through the formation of local sanitary societies and the general enlightenment of the public on community hygiene.[35] Laymen were urged not to think of health improvement as of purely medical interest. In the first place, it was intimately related to other social reforms, notably to the temperance movement. The latter was itself obviously a health movement, in that it was consciously directed against disease as well as against other evils resulting from the abuse of alcohol.[36] In the second place, laymen should realize that the health crusade transcended all contemporary reform movements in importance; since in contrast with the others, it was intended to benefit every class and section. If the people would but seek health first, all other things, from money to morality, would be added unto them.[37]

Some success attended these efforts, for active sanitary societies were founded in New York City[38] and, later, in other centers. In general, it may be assumed that this first national association did something to spread the gospel of health throughout the educated classes; for it received favorable publicity from contemporary papers and journals[39] and the members were individually directed to agitate their cause in influential circles.[40]

When the last gathering was held in June, 1860, presided over by a southern physician who was destined to surrender Savannah to Sherman some four years later, prospects were pleasing. The health movement was gaining momentum. The political hubbub in Baltimore and points South was not allowed to disturb the serenity of the sessions. Just because health reform was to aid all classes and sections, there was little conscious opposition to it, such as the antislavery and other contemporary movements encountered; and while there was a vast indifference, it was believed this could be overcome. The next meeting was to be held at Cincinnati—the first excursion into the Middle West.

Then came the War, and all plans were precipitately abandoned. Strong cultural ties between the sections, of which this national health association was one, were suddenly broken. Humanitarian efforts, North and South, were directed to the needs of troops, and in the former section expressed themselves in the well-organized and fairly effective work of the United States Sanitary Commission. This voluntary society was created in part by the same leaders who had been prominent in the Sanitary Conventions. They were inspired by the principles therein advocated, and, incidentally, by their knowledge of recent British experience in the Crimea.[41]

Although the Federal Army Medical Department was naturally inadequate to meet the sudden crisis of 1861, the Commission's efforts to afford it needed assistance were discouraged by all officials, from the Surgeon General to the President. The complete indifference of the Government to the health of volunteers arriving at Washington, and the appalling neglect of the wounded left on the first battlefields, inspired the Commission to new efforts. Perseverance, and the aid of McClellan and other field commanders, finally gained the Commission a tardy official recognition.[42] With the support of the humanitarian groups in the North, the Commission then forced a reorganization of the Army Medical Department; and, cooperating with this new Corps, succeeded in salvaging much of the health and morale of the troops. That this was an achievement of significance to public health as well as to military interests will be appreciated, when it is recalled that five-sixths of the deaths in the Union armies during the first year were reported as due to disease.[43]

The end of the war witnessed, in the South, the sudden destruction of the chief systematic free medical service for the poor which had developed in this country; viz., the regular medical and sanitary care afforded many of the negro slaves.[44] This many-sided institution of slavery had been, among other things, a sort of public health system; hence its destruction was no minor matter from a purely medical point of view. Disease conditions among the freedmen became alarming after 1864; nor was the health of the white population, exhausted by war, in any too satisfactory a state.[45] Medical science and health administration, moreover, like all other aspects of Southern culture, suffered as a result of the general disaster.[46] Northern philanthropy made some efforts, however, to remedy matters, especially with relation to the health of the freedmen.[47]

The War, of course, had its beneficent effects of a more or less incidental nature; to be chiefly enjoyed in the North. Physicians who saw army or navy service became, as such officers necessarily do, familiar with preventive medicine; and some carried this new interest back with them into civilian life.[48] The humanitarian sentiment aroused by the struggle promoted the formation of "aid societies" and, occasionally, of local and state sanitary associations; which in turn advocated the establishment of local and state health boards.[49] These efforts, "carrying on" the spirit of the antebellum agitation, began shortly to show results.

Four years after Lee's surrender, Massachusetts, which had consistently followed British sanitary reforms more closely than had any other American commonwealth, created the first state health board—along the general lines laid down in Shattuck's report submitted just nineteen years before.[50] Eighteen other states followed suit in the next decade.[51] The national government also developed its medical administration after 1865, not only through the reorganization of the Army Medical Department noted; but through a similar improvement of the Marine Hospital Service, and by the founding of the important Army Medical Library. The latter began, in 1879, to issue the important *Index Medicus*, and, in 1880, produced the first volume of the *Index Catalogue.*[52]

Meanwhile, the plan of a national health association was revived by a group of sanitarians in New York City; some of whom had been leaders in both the antebellum conventions, and in the federal Sanitary Commission.[53] As a result of their efforts, the American Public Health Association was founded in 1872; a body destined to take the leading part in the American health movement from that date until the present time.[54] One of its first activities was an investigation of the then existing machinery of sanitary administration throughout the Union. The resulting report showed that a considerable majority of American cities now had local health boards, still lacking in full-time medical officers; but in most cases endowed with executive as well as advisory functions. Although about half of the number had been created by state law, relatively few of the states themselves as yet possessed a health office.[55]

At this stage of things, the health movement the world over was reenforced by a somewhat unexpected revolution in medical science, of great significance to public hygiene. Medical practice in the eighteenth and early nineteenth centuries had been dominated by a number of theoretical "schools," whose procedures were so heroic as to make it a grave question whether their activities benefited the public health so much as they abused it. We moderns are doubtless overcomplacent, but it is difficult to look at one of the practitioner's bags of this period without a shudder. Early American medical leaders were trained in these procedures at London and Edinburgh, or in the pioneer American colleges which borrowed their principles from the same sources. A lack of professional standards in education and licensing did not help matters.[56]

In the thirties and forties, however, a more critical method in medical research began to be practiced at Paris,[57] and to some extent in other European centers. In due time the revolt against the old order extended from principles to practice. A reaction set in among younger physicians against the severity of the old régime of lancet, plasters and calomel. The growing popularity of homeopathy, Thomsonianism, and certain perfectionist health movements among the laity, contributed to the same end, viz., the rescue of the public from remedies sometimes worse than the diseases they professed to benefit. American medical students, diverted as a result of these changes from the British universities to Paris, absorbed there the new point of view.[58] Thus, in both Europe and America, the way was prepared for fruitful studies of disease causation, as well as of cure.

Hippocrates and Galen were held good authorities on etiology as late as 1800. To their views on noxious airs as the causes of epidemics, however, medieval experience had added a clearer consciousness of contagion; and Sydenham had contributed in the sixteenth century his concept of "epidemic constitutions;" viz. of the existence of a variable virulency in the "genius" of the contagion itself. Hence the etiology still common in 1860 expressed itself in terms of "miasmas" arising from decaying materials, which latter could be of local origin, or, again, might be imported.[59] This alternative was the basis for long and sometimes bitter disputes, particularly with regard to yellow fever;[60] for if the disease were of local origin and non-contagious in the literal sense, quarantines were useless, a view which naturally found some support among commercial interests. The general miasmatic etiology indicated, in addition to the possibility of quarantines of men and materials, one general prophylaxis against all the contagious diseases; namely, the general "clean-up" procedure which dominated most sanitary activity until almost the end of the century. This process had great value, notably in the case of such a filth disease as typhus; but was of little avail against certain other types of illness, such as influenza, or some of the so-called "children's diseases."

A fundamentally divergent view, which ascribed infection to the medium of a *contagium vivum*, had maintained a long but none too honorable existence. With the development of the simple microscope in the seventeenth century, speculative observers ascribed disease causation to the newly discovered animalculae; but their occasional claims to this effect were little heeded during that and the succeeding century.[61] After about 1830, the advent of the more critical method in medical research noted, and the improvement of the microscope, led to a more serious interest in this old hypothesis. French and German biologists contributed during the thirties and forties to the general knowledge of microorganisms; claimed that certain plant and animal diseases were due to parasitic enemies;[62] and not only clearly stated the so-called "germ-theory" of infection, but pointed the way to its scientific demonstration.

At least one original American physician, Dr. Josiah Nott, of Charleston and Mobile, was influenced by their work. His article on yellow fever, written as early as 1848, claimed that the spread of that disease could be explained only in terms of insect transmission; and incidentally remarked that other diseases were caused by microorganisms upon which mercury had a specific destructive influence. Oliver Wendell Holmes, among others, termed this an "ingenious" essay; but neither he nor other readers were seriously impressed, and it seems in due time to have been forgotten.[64] So, too, were the similar views expressed by Dr. J. K. Mitchell, of Philadelphia, in 1849. There were too many ingenious but apparently fanciful hypotheses appearing in medical literature to permit of the investigation of them all. It was hardly to be expected, moreover, that the first definite proofs of the germ hypothesis would be submitted in a new country, whose medical culture was still in large part borrowed from abroad.

It was chiefly in France and Germany that laboratory experimentation followed closely, or proceeded simultaneously with, the presentation of theories based simply upon general observation. The French and Germans were, then, to excel in the pure science of bacteriology, while Englishmen achieved preëminence in the applied science of sanitation. As early as 1837, Bassi discovered the protozoa associated with the pebrine disease of silkworms; in 1850 Davaine began his studies of the anthrax bacillus; in the same decade Tulasne and Kühn demonstrated certain organisms in plant diseases; and Pasteur began his reports on the bacterial origin of fermentation and putrefaction. Stimulated by the latter's work, Davaine returned to his studies of anthrax, and in 1863 produced the disease by innoculation with the bacillus of that name; thus affording, for the first time, what would today be considered a satisfactory demonstration of the truth of the germ hypothesis.

Opposition to the new etiology persisted in scientific circles, however, partly because some of the early evidence submitted was not entirely conclusive in character, partly because of other factors commonly associated with delay in accepting medical innovations. There followed, in the sixties and early seventies, Pasteur's great achievements in finally disproving the possiblity of spontaneous generation; his saving of the wine, silk, and wool industries of France from destruction by parasitic enemies; and his clear confirmation of the pioneer experiments on anthrax. Pasteur's work, while not as original as is popularly supposed,[65] was convincing, dramatic in character, and of the greatest economic significance. He was, therefore, the outstanding founder of bacteriology; though not necessarily the most important leader in the application of this new science to medicine. If any individual could claim the latter title, it was probably Robert Koch, who, in addition to important specific contributions to medical bacteriology, made its later development possible by affording it a technique and a procedure.[66]

Further discoveries of the bacterial origin of various diseases followed rapidly between 1875 and 1900.[67] New vistas opened in consequence before the eyes of physicians and sanitarians; disease was transmitted not so generally by air as it was by insects, water and food.[68] Early and definite diagnosis of infections became possible for the first time. There was something novel and dramatic about this, and the public became interested as well as the profession. New sanitary measures were indicated; and, with the development of vaccines and serums as by-products of bacteriology, a science of immunology appeared, making possible a new prophylaxis and new types of cures.[69] Past empirical achievements, such as vaccination and the beginnings of antiseptic surgery, were now rendered intelligible and consequently encouraged. It is also obvious, though it cannot be enlarged upon here, that concomitant engineering progress was of almost equal significance with that in medicine; making possible, as it did, our modern water and drainage systems.[70] As a result of these contributions, preventive medicine was apparently revolutionized. Prospects for controlling disease improved—"public health" was to become a reality as well as an ideal.

It is important, of course, to guard against exaggerating the significance of bacteriology. It is clear from what has already been said, that the public health movement had its genesis in a growing economic and social need rather than in pure science, and that it made considerable progress during the pre-bacteriological age. It is commonly overlooked that this early empirical health movement was apparently successful between 1830 and 1870, in suppressing typhus as well as smallpox, and, to some extent, malaria and yellow fever. Some of the outstanding achievements in later health work, moreover, such as the dramatic conquest of yellow fever in Cuba and Panama, have resulted from empirical processes which might conceivably have been discovered had bacteriology never existed.[71] In a word, empirical sanitation marches ahead of rational medicine in the general advance of science.

Yet, with such qualifications in mind, one may repeat that medical progress stimulated the already existing health agencies after 1875, made them more effective, increased public interest in them, and so in all these ways made possible their further development and extension. Continued urban growth contributed to the same end, by rendering ever more insistent the need for social control. In due time, all American states,[72] and all cities of any size,[73] created health offices with administrative powers. Today the prevention of disease, and, to some extent, its investigation, diagnosis, and cure, are as well recognized functions of state governments, as are education, or the building of roads,[74] though they are by no means so well supported as these latter activities.[75]

An attempt to create a national health department proved only temporarily successful (1879–1883);[76] but the federal government did begin to establish, in the eighties, a supplementary control of maritime quarantines;[77] and, as has already been mentioned, greatly improved its marine hospital and other special medical services. An exception to this statement, unfortunately, must be noted in the case of the Indian Bureau, whose medical service has remained inferior and ineffective.[78]

It is of interest to note in passing that American scientists began to make original contributions to bacteriological research, as in Sternberg's discovery of the pneumococcus (1880), and the work of Theobald Smith on Texas fever (1890);[79] that similarly original contributions were made to practical sanitation, as in Sedgwick's notable investigations of water supply and sewage disposal (1877 ff.)[80] and that the first American laboratory of hygiene was established at the University of Pennsylvania in 1892. American medicine and hygiene had come of age by 1890.[81]

Thus the health movement was well under way in the United States, as in Europe, before the close of the century. With what results? We have all been told of the outstanding accomplishments: the practical elimination of infectious fevers in temperate climes, the advance of sanitation in the tropics, the gradual mastery of endemic diseases like hookworm and tuberculosis, and the depressing effects of child-hygiene upon our mortality rates. All of these achievements have possessed truly incalculable economic and social significance; have indeed been among the factors which have made possible our present civilization.[82]

A word of caution, however, is in order. Other forces besides the efforts of sanitarians and physicians, may have contributed to the improvement of health; e. g., certain obscure biological changes in pathogenic bacteria, or in their human hosts.[83] Again, it is well to guard against a current exaggeration of the degree of success already attained in the old warfare against disease. Little headway has been made against most of the respiratory infections; while degenerative diseases, sometimes the cruelest of all, seem to have increased as the fevers have declined.[84] There has been tragic delay, moreover, in actually controlling diseases which are already potentially preventable; largely because the sum of all forms of medical service available in American society is still utterly inadequate for present American needs.[85] Yet few will question that the health movement in the United States, and in the world at large, has already proved of vital benefit to man. It is, more-over, replete with promise for his future.

Notes

1. The settlers were fortunately free from leprosy, although it was then still common in parts of Europe, and has never been entirely eradicated. They brought with them, however, smallpox, tuberculosis, the various "children's diseases," and most of the other white man's burdens of this sort. Yellow fever is usually thought to have been an American or African contribution; but the persistent tradition of a Columbian origin of syphilis (which is supposed to have been epidemic in puritan Boston in the seventeenth century) is open to serious question. Various critical authorities have denied it from time to time (e.g., the American, Noah Webster, in the 18th century; Epidemic and Pestilential Diseases, Hartford, 1799, 1: 149, 150; 2: 261, 270–274). The present authority on the subject, Karl Sudhoff, of Leipzig, deems the disease to have been of pre-columbian origin: Der Ursprung der Syphilis, Leipzig, 1913, pp. 6–17. For a bibliography, see Hirsch, A., Geographical and Historical Pathology, transl. by C. Creighton, Lond., 1885, p. 59.
2. While certain well-known advances were made in European medicine in the 17th century, these do not seem to have affected practice in the distant English colonies; nor did European medicine itself assume a modern tone. The best illustration of this is to be had in the persistence of astrological elements, on both sides of the Atlantic. The literature on hygiene seems more modern, perhaps because it was less technical, than that on medicine proper. See Cleu, H. Traités d'hygiène du xvii^{e} siecle, *Bull. Soc. franc. d'hist. d. l. méd.*, 11: 59–76, 1912; in which are noted such works as Porchon's De la Nécessité de l'Astronomie pour exercer la Médecine, Paris, 1688. The astral tradition was firmly established in America, and long persisted. Witness the publication at New York, as late as 1850, of Joseph S. Brown's Observations on Planetary and Celestial Influences in the Production of Epidemics, etc.
3. This was of course due to a lack of professional standards in a frontier country, as well as to scientific limitations. The bizarre character of early colonial medicine has been frequently commented upon. See, e.g., Wertenbaker, T. J., The First Americans, chap. 7, *passim*. The most delightful illustration the writer has noted is Dr. George Sewell's essay On Snails (1728), reprinted in the *New Hampshire J. Med.*, 1: 87; 88, 1850. For illustrations of ancestral therapeutics, see Holmes, O. W., Medical Essays, in his Works, Boston, 1892, 9: 312–369.
4. The published colonial records are replete with materials relating to maritime quarantines; they also contain occasional references to attempts to establish internal quarantines against epidemics. For a brief history of colonial port quarantines, see Jewell, W., History of Quarantine, *Proc. 3rd Nat. Quarantine & San. Conv.*, Boston, 1859, pp. 278ff. Occasional legislation on such other subjects as innoculation, and the control of medical practice, are noted in Packard, F. R., The History of Medicine in the United States, Phila., 1901, pp. 452–465.
5. The witchcraft persecutions were, in a sense, prophylactic measures. Theological prophylaxis is doubtless the oldest form, since it followed logically from a belief in the theological causation of disease. Christian authorities,

from Origen to Luther, gave it their support; and it persists, of course, to the present. Eighteenth century rationalism, however, seriously undermined it; so much so that when the Presbytery of Edinburgh requested Lord Palmerston in 1850, to prepare against approaching cholera by proclaiming a national fast, the gentleman replied that what they needed was national sanitation. Health historians seem to view this episode as a sign of the times. See, e.g., Seegenn, in *Wien. Med. Wchnschr.*, quoted editorially in the *Sanitarian*, 1: 17, 1873; Simon, Sir J., English Sanitary Institutions, Lond., 1890, pp. 218, 219; Smith, S., Development of American Public Health Endeavor, *Am. J. Public Health*, 5: 1115–1119, 1915; Newsholme, Sir A., Evolution of Preventive Medicine, Balt., 1927, p. 10.

6. There are no comprehensive or critical histories of colonial disease, though interesting material may be found in such early studies as William Currie's Historical Account of the Climates and Diseases of the United States of America, etc., Phila., 1792; and in Noah Webster's classic contribution, Epidemic and Pestilential Diseases, 2 vols., Hartford, 1799. The former author, in a second work (Rise and Progress of Yellow Fever, etc., Phila., 1800), ridiculed (p. 47) Webster's "researches among revolving planets, blazing comets, exploding volcanoes," etc., but granted him some sound observations. Currie brought out a third study, A View of the Diseases Most Prevalent in the United States of America, Phila., 1811, which is the best thing of its kind for that period. As an illustration of early unofficial efforts to develop municipal organization to deal with epidemics, see Proceedings of the Committee of Citizens of Philadelphia, to Attend to and Alleviate the Sufferings of the Afflicted with the Malignant Fever, etc. (1793), Phila., 1848, *passim.*

7. European literature on hygiene increased steadily in volume after the invention of printing, so that by the eighteenth century there was already an embarrassment of riches in this field. Haller, in his notes on Boerhaave's Methodus Studii Medici, 1751, prepared one of the first bibliographies on hygiene. This, and a large medical catalogue by W. G. Ploucquet, of Tübingen, 1803, were the bases of the list drawn up by John Sinclair, in his Code of Health and Longevity (4 vols., Edinb., 1808), 2: 187ff.; which notes nearly nineteen hundred items, chiefly of the seventeenth and eighteenth centuries. Vaidy, writing on Hygiène militaire, in the Dictionnaire des Sciences Médicales, Paris, 23: 1818, gives a list (pp. 93–96) of fifty-four special studies in this field. Note, in addition, Daniel, C. F., Entwurf einer Bibliothek der Staats-Arzneikunde, u. s. w., Halle, 1784. Various histories of the subject also appeared after the middle of the eighteenth century; e. g., Mackenzie, J., The History of Health and the Art of Preserving It, Edinb., 1758. The most thorough of these early historical studies, however, are Sinclair's monumental work, noted above; Halle et Nysten, Hygiène (especially the Premiere Partie, Histoire de l'hygiène publique,) *Dictionnaire des Sciences Médicales*, Paris, 23: 510–588, 1818; and Simon, L., "Recherches Historique sur l'Hygiène," *J. d. prog. d. sc. et inst. méd.*, Paris, 9: 104–155, 1828.

8. Note the title of Halle et Nysten, *op. cit.* There was also a growing recognition of the permanent responsibility of the state for this public phase of health; and of the vital social significance of prevention, as compared with cure. See, e. g., Roberton, J., Medical Police, etc. ed. 2, London, 1812, 2: 350–352; and Max Rubner, Die Geschichte der Hygiene, in Handbuch der Hygiene, (herausgegeben von Dr. Rubner), Leipzig, 1911, 1: 28. The 18th century saw also the first studies in public, as distinguished from personal hygiene; excepting only the early work of Paracelsus on miners' diseases. Various publications appeared in Italy, Germany, France, and England, on occupational diseases, the prevention of fevers, army and naval hygiene, etc. The first comprehensive works on demography and public health, those of Süssmilch and Johann Peter Frank,

appeared in Germany in the same general period.

9. The famous Boston controversy between Drs. Boylston and Douglas, upon the introduction of inoculation there, will be recalled. This process was not without its dangers, since it resulted in some deaths, and may have spread the disease; but it reduced the death rate considerably, and also prepared the way for the introduction of vaccination. Within two years after Jenner's discovery, this latter process was being employed in various American towns, suggesting that cultural transit in medicine was relatively rapid by this period. There is quite a literature on the history of inoculation in this country; e. g., Gale, B., Dissertation on the Inoculation of the Smallpox in America; Toner, J. M., History of Inoculation in Pennsylvania, 1865, History of Inoculation in Massachusetts, 1867. See also articles on Boyleston, D., and Thompson, A., in Kelly, H. A., and Burrage, W. L., Dictionary of American Medical Biography, N. Y., 1928.

10. The work of Howard on jail fever in England, of Rousseau on child hygiene in France, and of the American Benjamin Thompson (Count Rumford) on the general health of the poor in Bavaria, are cases in point. On Howard, see, beside his own works, Guy, W. A., John Howard's Winter's Journey, London, 1882, *passim*. On Rousseau, see Proust, A., Traite d'Hygiene Publique et Privée, Paris, 1882, p. viii. On Thompson's work in Bavaria, see Rubner, *op. cit.*, pp. 29–31. Rousseau was not the only general philosopher who displayed his interest in hygiene; Locke, Kant, and others tried their hands at it; Sinclair, *op. cit.*, 3: 431, 246ff.

11. A modern authority, Sir Arthur Newsholme (The Ministry of Health, 1926, p. 166) is of the opinion that disease is more often a cause of poverty than is poverty of disease, in a word that disease is usually the beginning of a family's troubles. These once under way, of course, a vicious circle is established, which may involve crime and immorality, as well as the factors noted.

12. It is difficult to discover any cases of reforms in health administration, from those traditionally ascribed to the Emperor Sigismund, in 1426, to the Massachusetts sanitary survey of 1850, not occasioned by the threat of epidemics. This rôle of epidemics in making reform possible is interesting, in view of the fact that such diseases are not usually so serious a threat to public health as are the endemic ones. This was realized by pioneer American sanitarians, (See J. N. Newman's report on The sanitary police of cities, *Am. Med. Ass. Trans.*, 9: 431–481, 1856); and is clearly pointed out by Ravenel, M. P., Endemic diseases versus acute epidemics, *Am. J. Pub. Health*, 10: 761ff., 1920. For the history of the European epidemics, consult A. Hirsch, Geographical and Historical Pathology, London, 1885, *passim;* and C. Creighton, History of Epidemics in Britain, Cambridge (Eng.), 1894, 2: chap. 9.

13. For a description of the Prussian system of the eighteenth century, with its central "Collegium Sanitatis" and district physicians, see Abel, R., Begriff, Bedeutung u. Entwicklung der praktischen Hygiene, in Handbuch der Praktischen Hygiene (herausgegeben von Dr. Abel), Jena, 1913, 1: 8, 9.

14. For developments in Prussia and other German states after 1800, see Abel, *op. cit.*, p. 9ff; Guttstadt, A., Deutschlands Gesundheitswesen, u.s.w., Leipzig, 1890; and the various works dealing with the several states. For France, consult Rubner, *op. cit.*, 34ff.; Vaillard, Role de l'academie de médecine dans l'evolution de l'hygiène publique, 1820–1920, *Bull. l'Acad. Méd.*, 3 s., 84: 401–429; the article on Conseils d'Hygiene publique et de Salubrité, in Tardieu, A., (ed.), Dictionnaire d'Hygiène Publique et de Salubrité, Paris, 1852, 1: 378–416; Daniel, B., Hygiene in France, *San. Rev.*, 2: 19ff., London, 1856; and the volumes of the *Ann. l'Hyg. Pub.*, established by Duchatelet at Paris, 1829. For Italy, see Millot, G., L'Hygiène Publique en Italie, Paris, 1876, *passim*. Interesting descriptions of national hygienic institutions in Spain *ca.* 1830, are given in Horner, G. R. B., Medical and Topographical Observa-

tions upon the Mediterranean, and upon Portugal, Spain, and Other Countries, Phila., 1839, pp. 40–44, 74–79. After *ca.* 1840, the other Latin states patterned their institutions on the French. Note speeches of the Italian and Spanish delegates to the International Congress of Hygiene and Demography, Paris, 1889, as reported in the *Lancet* for Aug. 3, 1889. There are various works relating to Sweden, Switzerland, The Netherlands, etc., but lack of space prevents the listing of them here.

15. For early medical consciousness of this situation, see Ferriar, J., Medical Histories, Lond., 1810, 2: 213–247; Roberton, *op. cit.*, p. xxxff.
16. What made it most apparent was the higher urban mortality rate. See, e.g., Sinclair, Health Code, etc., Edinburgh, 1808, 1: 111, 112; Black, J., The comparative mortality of a manufacturing and an agricultural district, *J. Pub. Health* (Eng.) for Dec., 1855, summarized in *Ranking's Abstracts*, 23: 6–8.
17. There was a whole series of commission reports. The most remarkable was Chadwick's report, for the Poor Law Board, of the causes of disease throughout Great Britain (Report . . . from the Poor Law Commissioners on . . . the Sanitary Condition of the Labouring Population of Gt. Britain, London, 1842). This report, based upon returns from the poor-law district physicians, was probably the first health survey ever made of an entire nation; and is one of the most valuable of all sources for British social history in the nineteenth century.
18. For a detailed description of British legislation, see Simon, Sir J., English Sanitary Institutions, p. 180ff. Briefer accounts are given in Morris, Sir M. A., The Story of English Public Health, N. Y., 1919.
19. The American health literature of the period is full of quotations, references, praise, etc. relating to British activities; including some conscious recognition of the influence exerted by the same upon American developments. See, e.g., *A. M. A. Trans.*, 2: 487–554, 1849; Report of . . . the Citizen's Asso. of New York Upon the Sanitary Condition of the City, N. Y., 1865, pp. xl, xli; Smith, S., Results of sanitary improvements of towns, *Sanitarian*, 1: 14–17, 1873; Walcott, H. P., Public health in America, *Trans., 15th Int. Congr. Hyg. & Demogr.*, 1: 62, 1913, etc. British influence upon the United States was due to three circumstances: (1) the rapid progress made in England, (2) the similarity of urban conditions in the two countries, and (3) the common language and consequently close cultural relations in general obtaining between them. (It is a truism that analogous British influence was exerted, for similar reasons, upon other American reform movements of the period.) References are occasionally found in American health literature to French and German influence. Rawlings, I. D., e.g., observes that the work of the German sanitarian, Pettenkofer, "stimulated the first agitation in America for sanitation as a public health activity," (The Rise and Fall of Disease in Illinois, Springfield, Ill., 1927, p. 131).
20. In New York City, where conditions were unusually bad, the annual mortality rate of 1810 had been 1 death for every 46.5 persons in the population; this had risen by 1859 to 1 in 27! Dr. J. H. Griscom, a former "City Inspector," considered this significant, despite the imperfection of the statistics prior to *ca.* 1850, which were based upon sextons' reports of burials. (See Bolduan, C. F., Over a century of health administration in New York City, *N. Y. C. Dept. of Health. Mon. Ser.*, No. 13, p. 3, March, 1916; and Griscom's statements in the *Proc. 3rd Nat. Quar. & San. Conv.*, Boston, 1859, p. 241). This increase in mortality was usually ascribed, as in England, to the higher rates in cities, and, within the latter, to those obtaining in slum districts. Still further refinement seemed to indicate that the fundamental cause of the mortality increases lay in the high infant death rate of the slums. During the decade preceding the Civil War, the urban statistics available indicated that about 20 per cent of the total mortality was

caused by deaths under one year, and about 50 per cent by those under five years. A committee of the A. M. A. ascribed the infant mortality not only to the obvious poverty and filth of the slums, but also to lack of mothers' nursing, and to a "widespread" tendency to contraception and abortion, evils "scarcely known" before. All family relations were coming to be ignored "in these degenerate [Victorian] days." See *A. M. A. Trans.*, 2: 520, 1849; 10: 93–99, 1857.

21. It is difficult now to realize the terror inspired in American towns by yellow fever. There are many eye-witness accounts of the epidemics, relating to Philadelphia, Norfolk, Savannah, New Orleans, etc., from 1790 to 1875. See, e.g., a description of the Savannah epidemic of 1854, by a leading local physician, in Shryock, R. H., [ed.], Selections from the letters of Richard D. Arnold, *Bull. Johns Hopkins Hosp.*, 42: 180–184; 213; 214, 1928, hereafter referred to as the Arnold Letters.

22. A list of the dates, when health boards were established in cities of the United States is given in Toner, J. M., Boards of health in the United States, *Rep. & Papers, A. P. H. A.*, 1: 499ff., 1873.

23. Farr's career and achievements in demography are given in N. A. Humphries' Biographical Sketch, included in his edition of Farr's Vital Statistics, London, 1885. Farr's work was constantly referred to by American sanitarians after *ca.* 1840. A report on early reforms in American registration, especially in Massachusetts and New York, is given in the *A. M. A. Trans.*, 2: 487, 1849. Many states, however, refused to provide for any registration in the antebellum period; the efforts of the A. M. A. to the contrary notwithstanding. In Georgia, e.g., registration memorials to the Legislature were "fairly hooted" as "tricks of the doctors," Arnold Letters, pp. 171, 172.

24. There is a considerable literature on the history of municipal health administration. For general surveys of existing machinery in the late forties, see the *A. M. A. Trans.*, 1–3, *passim*. The details of organization and regulations of a progressive board are given in the Rules for the Government of the Philadelphia Board of Health, Phila., 1853. Histories of local administration are available for most of the older ports; e.g., Bolduan's sketch (note 20) of New York; Howard, W. T., Public Health Administration and the Natural History of Disease in Baltimore, Maryland, 1797–1920, Washington, 1924, chaps. 3, 4; Whipple, G. C., State Sanitation, Cambridge, 1917, chap. 1, gives the early story of Boston and other Massachusetts towns; Abbot, A. C., The Development of Public Health Work in Philadelphia, Founder's Week Memorial, Phila., 1909, pp. 561–592; the evolution of administration in Savannah may be traced in Gamble, T. J., History of the Municipal Government of Savannah, 1790–1901, (appended to the annual report of the mayor, 1901); etc. A general picture of present municipal administration will be found in Municipal health department practice for the year 1923, based upon surveys of the 100 largest cities in the United States, U. S. public health service, *Pub. Health Bull.*, No. 164, Washington, 1927.

25. Reprinted in Whipple, State Sanitation, pp. 241ff. An excellent brief commentary upon the report is given by Emerson, H. Public health diagnosis, *Jr. Prev. Med.*, 1: 409–412, 1927. this was a most thorough report, and embodied the first comprehensive plan for state administration, prepared in the United States. It was occasioned by threats of cholera, and memorials from the American Statistical Asso. and the Mass. Medical Society; and carried out by Lemuel Shattuck, the American Chadwick. (See editorial, *New Englander*, 7: 310–314, 1849.) Its historical significance can be exaggerated, however, since it was preceded by various local surveys and reports (e.g., Griscom, J. H., The Sanitary Condition of the Laboring Population of New York, with Suggestions for its Improvement, N. Y., 1845); and by the national questionnaire surveys conducted in the later forties by the A. M. A. Shattuck's report, moreover, was unfortunately not heeded at the

time, and became the basis for the State Board established in 1869, only after other influences had promoted public recognition of the need for state organization. An instance of exaggerating Shattuck's significance is afforded in Rawlings, I. D., The Rise and Fall of Disease in Illinois, Springfield, Ill., 1927, p. 13.

26. LEIGH, R. D., Federal Health Administration in the United States. N. Y., 1927, chaps. 4, 5.

27. Dr. Charles Caldwell in 1832, then at Transylvania University, first clearly advocated a national medical association. In 1835, the Georgia Medical College (Augusta) urged the same plan. In 1840 the New York State Medical Society took up the matter; and by 1845 secured enough support from medical schools and societies to call the first meeting, to organize a national association, at New York City in 1846. The desire to improve standards in medical education, and to divorce the degree-granting and licensing powers (then generally combined in all sorts of medical colleges) were the motives bringing about the organization. See *A. M. A. Trans.*, 9: 368; 369, 1856; and Davis, N. S., History of the American Medical Association, From its Organization up to January, 1855, Phila., 1855. The history of early American medical education is given in Davis, N. S., History of Medical Education and Institutions in the United States, Chicago, 1851; and in F. R. Packard, The History of Medicine in the United States, chaps. 4 and 5, *passim*.

28. These were the work of its standing Committee on Hygiene. This Committee was organized at the suggestion of the Medical Department of the National Institute at Washington. (This latter organization had formed a hygiene committee in 1845, and had unsuccessfully attempted for three years to make a survey of national health. In 1848, therefore, it requested the newly formed A. M. A. to appoint its own Hygiene Committee, and to take over this work. See *A. M. A. Trans.*, 1: 305–310, 1848). It is interesting to note here that the A. M. A. Committee on Hygiene reported, in 1851, that some attention should be given to rural, as well as to urban hygiene, *A. M. A. Trans.*, 4: 517; 518. This Committee also interested itself in other matters besides sanitation, e.g., it prepared a petition to Congress for a pure drugs act, *A. M. A. Trans.*, 1: 311–335, 1848. For its main reports on urban sanitary conditions and health administration, see *A. M. A. Trans.*, 8: 452ff., 1849, etc.

29. This is the impression one gathers in reading the annual transactions. The same opinion was expressed by Dr. J. H. Griscom to the Third National Sanitary Convention (*Proc.*, N. Y., 1859, p. 212); and by Dr. H. I. Bowditch, to the International Medical Congress, Phila., 1876 (Public Hygiene in America, Boston, 1877, p. 37). Nevertheless, the A. M. A. was really the first organization to begin educating the intelligent American public and medical profession on the need for sanitary reform and demography. See, for a recognition of its influence, Smith, S., Remarks, *A. P. H. A., Papers & Rep.*, 22: 21; 22, 1897.

30. The originator of the plan for a national convention was Dr. Wilson Jewell, of the Philadelphia Board. How he persuaded that body to issue a call for the convention, and the response this met with, is told by Dr. Jewell, in a letter to Dr. J. H. Griscom, Phila., 1859, printed in the *Proc. 3rd Nat. San. Conv.*, N. Y., 1859, pp. 3–6. See also the *Minutes* of the first convention, Phila, 1857, pp. 3–11.

31. *Minutes 2nd Nat. Quar. & San. Conv.*, Balt., 1858, p. 12. The fourth meeting discussed the question of permanent organization; and appointed a committee to report a plan for the same. *Proc. & Deb. 4th Nat. Quar. & San. Conv.*, Boston, 1860, pp. 8, 13, 14, 155.

32. Dr. Jewell, in welcoming the first meeting at Philadelphia, declared: "I hail it as the dawn of a new era in the domain of American science, that we are convened to deliberate upon the questions relating to the improvement of public health. It is the introduction to a field of learning almost unexplored in this country, yet a field as interesting

as it is extensive, and as important as it is uncultivated." At the second meeting, held at Baltimore, he declared that the conventions were "destined to revolutionize the public mind and will;" and that "the work of sanitary reform in our country has commenced in earnest through the instrumentality of this Convention."

33. The detailed reports on these subjects, and the interesting debates thereon, offer an excellent cross-section of American sanitary interests and problems in this period. See the *Proc. 3rd Nat. Quar. & San. Conv., passim.*

34. The federal problem has always greatly complicated the development of health administration in this country. See Leigh, R. D., Federal Health Administration in the United States, N. Y., 1927, especially chap. 15.

35. Dr. Griscom, serving as president of the third gathering, declared that legislative reform could be secured only by educating the public through continuous agitation. He called their attention to the successful agitation conducted by the Health of Towns Associations in Great Britain, and urged that all members present educate their own communities, and persuade them to form health associations; *Proc. 3rd Nat. Quar. & San. Conv.*, p. 241.

36. The close connection between drink and disease was well recognized in the British and American urban surveys of the forties, and after, and was the occasion of more popular agitation than historians of the temperance movement have recognized. A New York City editor remarked in 1829, e.g., that: "For some time past, the public papers have been crowded with paragraphs, resolutions, proceedings, etc., showing the great destruction to human life, which is brought on by intemperance in the use of spirituous liquors. Sermons have been preached, orations delivered, and even toasts drank [!] against this destructive vice;" *N. Y. Enquirer*, quoted in the *Boston Christian Reg.*, Feb. 7, 1829. The editor of the latter organ thought this was exaggerating the relationship between drink and disease, however, and noted that out of 1238 deaths reported in Baltimore in 1828, only 34 were listed as due to intemperance. For a modern analysis of this relationship, see Emerson, H., Prohibition and public health, *Survey*, 41: 289ff., 1928. Note also Colvin, D. L., Prohibition in the United States, N. Y., 1926, quotations from sources given in chap. 1, *passim.*

37. A moral enthusiasm sometimes appeared, which was analogous to that associated with such contemporary movements as those against slavery and intemperance; albeit the scientific character of the gatherings tended to inhibit the same. Gen. P. M. Wetmore, a delegate from the New York Sanitary Association, referred to the health movement as "a crusade against a gigantic and growing evil," etc.; *Proc. 3rd Nat. Quar. & San. Conv.*, pp. 299, 230.

38. This New York City Society was active in promoting a legislative investigation of the city, and the work thus begun eventually led to a reorganization of the city health administration. See the Report of the select committee appointed to investigate the health department of the City of New York, in Senate, Feb. 3, 1859, *Senate Document, No.* 49. The famous report of the Citizens' Committee, prepared by Stephen Smith, Elisha Harris, *et al.*, (which led to the reorganization) is in the Report of the Council of Hygiene and Public Health of the Citizens' Asso. of New York, upon the Sanitary Condition of the City, N. Y., 1865.

39. See, e.g. the *Phila. North American*, May 13, 14, 15, 1857; the *Balt. Republican*, April 29, 1858; the *Bost. Herald*, June 12, 17, 18, 1860. Illustrations of a growing popular interest in sanitation and public hygiene may be observed in the editorials appearing in the *N. Y. Herald*, Aug. 27–30, 1859.

40. See note 35. For a general estimate of the influence of the Conventions, in arousing public and professional interest, and in encouraging administrative organizations, see Smith, S., Historical Sketch of the American Public Health Association, *Am. Pub. Health Ass., Rep. & Papers*, 5: ix, x, 1879.

41. The genesis of the organization is described in Stillé, C. J., History of the

United States Sanitary Commission, Phila., 1866, chaps. 1–3. See also, Evans, T. W., La Commission Sanitaire des Etats-Unis, Paris, 1865; Wormelley, K. P., The Cruel Side of War with the Army of the Potomac: Letters from the Headquarters of the U. S. Sanitary Commission, etc. (1862), Boston, 1898, p. 25ff.

42. Stillé. *Op. cit.*, pp. 57–64.

43. An illustration of the magnitude of its operations may be observed in the sequel to Gettysburg, where the two armies left some twenty thousand wounded upon the field, with practically no medical or hospital units for their care. The entire number were attended by the Commission's organizations; *ibid.*, pp. 376–389; Report on the operations of the Sanitary Commission during and after the Battle at Gettysburg, *U. S. San. Comm. Doc.*, No. 71, N. Y., 1863, *passim.* For the army mortality rates, differentiating those due to disease, and those due to losses in action, see Preliminary report on the mortality and sickness of the volunteer forces, etc., *U. S. San. Comm. Doc.*, No. 46, N. Y., 1862, pp. 5–7.

44. The free medical service afforded to slaves, which on some of the better plantations also involved a strict sanitary regimen, was somewhat analogous to the partly free medical service maintained today by some large industrial concerns. See the Arnold Letters, pp. 158–163, 224–226; Bassett, J. S., [ed.], The Plantation Overseer, Northampton, 1925, *passim;* Phillips, U. B., [ed.], Plantation and Frontier, Cleveland, 1910, 1: 109–129, 309–318; Phillips, U. B., and Glunt, J. D., [eds.], Florida Plantation Records, St. Louis, 1927, *passim.*

45. The mortality records of Southern cities, which suffered directly from the War, are interesting in this connection. In Savannah, e.g., the death rate of whites was generally higher than that of the "blacks and colored," from 1810 to 1863; when the situation was reversed. The rates for both races rose rapidly, during the want and suffering of the reconstruction period, but that of the negroes more so than that of the whites. The following figures would seem significant, even though the reports were based only upon interment records:

Date	Percentage of deaths per population		Remarks
	Whites	Blacks & "colored"	
1854	9.79	3.43	Yellow Fever, note Negro resistance.
1855	3.20	3.07	
1860	2.53	2.32	An average ante-bellum year.
1863	2.09	2.83	Negro rate passes white, for first time.
1864	3.26	3.13	Savannah besieged.
1865	5.01	5.54	Emancipation; destitution.
1866	2.12	5.96	Negro rate greatly exceeds white.
1867	1.82	3.75	Negro rate greatly exceeds white.
1868	1.83	3.55	Negro rate greatly exceeds white.
1869	1.50	2.54	Negro rate greatly exceeds white.

The data are taken from Bancroft, J., Census of the City of Savannah, Savannah, 1848, p. 54; and Duncan, W., Tabulated Mortality Record of the City of Savannah. Savannah, 1870, p. 36. See also, Hoffman, F. L., Race traits and tendencies of the American negro, *Am. Econ. Asso. Pub.*, 9: 1–329.

46. Signs of retrogression in health administration after the War were numerous; e.g., arrangements for free vaccination in Mississippi were abandoned; South Carolina gave up the registration of vital statistics; Columbia, in that state, reported that "political trials" interfered with sanitary improvement, etc. (Bowditch, Public Hygiene in America, Boston, 1876, pp. 74, 67, 100.) For informal comment on the effects of the War upon a southern medical college, see Arnold Letters, *passim.*

47. Notably the establishment of the Freedmen's Bureau or "Lincoln" hospitals.

48. Army and navy medical service is, *ipso facto*, a type of state medicine; and has always afforded training in pre-

ventive work. It is natural, therefore, that these services have contributed much to the development of preventive medicine in the United States, as well as in other nations. It is highly probable that the various young physicians who enlisted during the Civil War, and even afterwards manifested an active interest in public health, achieved that interest in the service. There were many such, e.g., Dr. S. W. Abbott, of Massachusetts, a pioneer American demographer; Dr. T. F. Wood, the founder of the North Carolina State Board of Health; and perhaps most notable of all, Dr. John S. Billings, whose career as a sanitarian and librarian is well known. A similar interest in preventive medicine was aroused in some of the surgeons of the revolutionary and 1812 periods, as a result of army service. A number published essays on the subject, apparently the first studies in public hygiene to appear in this country; e.g., Tilton, James, Economical Observations on Military Hospitals and the Prevention and Cure of Diseases incidental to an Army, Wilmington, Del., 1813. There may be further material relating to this aspect of military medicine, in the large eighteenth century medical collection included in the Toner Mss. of the Library of Congress.

49. LEEDS, A. R. Sanitary science in the United States—its present and future. *Ecl. Eng.*, 20: 6–14, 1879.

50. WHIPPLE. State Sanitation, pp. 39–63.

51. LEIGH. Federal Health Administration., pp. 11, 12, 22.

52. *Annual Rep. Surg. Gen., U. S. Army*, 1916, pp. 17, 18.

53. Notably Dr. Elisha Harris, of New York City, who had been an active leader in the Sanitary Conventions, in the Sanitary Commission, and who served as the first secretary of the A. P. H. A.

54. For the origin and early work of the A. P. H. A., see the several historical essays of Dr. Stephen Smith, the first president, who lived to enjoy its fiftieth anniversary. Note especially his Historical sketch of the American Public Health Association, *A. P. H. A. Rep. & Papers*, 5: xiff., 1879; and The History of Public Health, 1871–1921, in M. P. Ravenel (ed.), A Half Century of Public Health, N. Y., 1921, pp. 1–12. See also Ravenel, M. P., The American Public Health Association, Past, Present, Future, *ibid.*, pp. 13–55.

55. TONER, JOHN M. Boards of Health in the United States, *A. P. H. A. Rep. & Papers*, 1: 499ff., 1873. This is only one of a series of reports which have been made, from time to time, on existing state and local administration. The first attempt at such a report seems to have been made by the Medical Department of the National Institute, 1845–1848 (see note 28). Then came the reports of the A. M. A. (1848), and of the Sanitary Conventions (1858 and 1859). After Toner's report of 1872, came a survey by Bowditch, reported in his Hygiene in America, Boston, 1877, pp. 39–135. Notable among the more recent national surveys are S. W. Adams' Past and Present Condition of Public Hygiene in the United States, Boston, 1900; and Chapin, C. V., A Report on State Public Health Work, Chicago, 1915.

56. These "schools," such as that of the Brunonians, were much given to extremes in both theory and practice. Their founders were ingenious system-makers rather than experimenters; more given to controversy than to demonstration. Benjamin Rush best represents the type in America. For accounts of such eighteenth century leaders as Brown, Broussais, Cullen, etc., consult Garrison's standard History of Medicine, ed. 2, Phila., 1917, pp. 308, 357, 415. For the American phase of the story, see Packard, F. R., The History of Medicine in the United States, Phila., 1901, *passim.* There were American editions of the works of these masters, e.g., Brown, John, The Elements of Medicine, Phila., 1790. The distribution of patent medicines during and after the eighteenth century, and the popularity of various types of quackery, were on such a scale as to offer a serious menace to the public health; in addition to all that it suffered at the hands of orthodox practitioners. The New York State Medical Society reported on the dangers of "secret medicines," as early

as 1829. For early American standards in medical training and licensing consult N. S. Davis, The History of Medical Education and Medical Institutions in the United States of America, Wash., 1877, *passim.*

57. BOWDITCH. Hygiene in America, pp. 12–18.

58. BOWDITCH, *ibid.*, pp. 19–28, gives an interesting brief account of this shift in American cultural inspiration from London to Paris. It is to be remembered, however, that the common language made possible a continued British influence on American medicine, via the professional journals, and the many American editions of British works. This was so true that, when nationalistic feeling began to express itself in the new American Medical Association of the forties, there was much lamenting of the cultural dependence on Britain. See the annual reports of the Association's Committee on Medical Literature, especially Oliver Wendell Holmes' report for 1848, *A. M. A. Trans.*, 1: 283–288; also the reports of N. S. Davis, for 1853, *ibid.*, 6: 118–120; and of S. D. Gross, for 1856, *ibid.*, 9: 339ff. Holmes' report is a valuable essay on American culture; in the course of which he remarks (p. 286) that American medical writers devote their time chiefly to putting "English portraits of disease in American frames." Of course, such healthy criticism was in reality itself the evidence of a dawning cultural independence, which was already expressing itself in important original work on typhus (Gerhard), anesthetics (Long), yellow fever (Nott), obstetrics (Holmes), gynecology (Sims), etc. For early achievements in American medicine, and its chief leaders, see the interesting essays in Clarke, E. H., Bigelow, H. J., *et al.*, A Century of American Medicine, Phila., 1876.

59. The development of these principles through the centuries can be well traced in Sinclair's voluminous Code of Health, Edinb., 1808, (vols. 2, 3), which contains useful translations of many of the important sources. See also the French and German studies listed above, notes 7, 8 and 13. For interesting brief accounts see Sir Arthur Newsholme's Evolution of Preventive Medicine, Balt., 1927; Sir William Osler's The Evolution of Modern Medicine, New Haven, 1921; C. E. A. Winslow's, The Evolution and Significance of the Modern Public Health Campaign, New Haven, 1923. Sudhoff's valuable notes on the history of actual sanitary practices, based upon these principles, are given in the Internationale Hygiene-Ausstellung; Historische Abteilung, Dresden, 1911, *passim.* Note also his brief but stimulating essay: The Hygienic Idea and its Manifestations in World History, translated by F. J. Stockman, and included in the collection of his essays edited by F. H. Garrison, New York, 1926.

60. As in the long and rather tense debates in the Third National Sanitary Convention, 1859; *Proc.*, pp. 23–83.

61. Girolamo Fracastoro first clearly conceived a biological theory of infection (1546). The first to advocate the theory on a basis of microscopic observation was the German Jesuit, Athanasius Kircher, in his Scrutinium Physico-Medicum Contagiosae Luis, quae dicitur Pestis, etc., Lipsiae, 1659, (pref. dated 1658), pp. 17, 18, 37, 45. Plenciz, of Vienna, and others, advocated the theory during the eighteenth century; Rubner, M., Die Geschichte der Hygiene, in Handbuch der Hygiene, p. 37.

62. RUBNER, *ibid.*, p. 38.

63. The outstanding formulator of the germ theory in the thirties was the German, Henle. Émile Duclaux observes that for Henle: "The germ of the disease was not something imposed upon the sick person and independent of him; it was something belonging to him, borrowing from him a sort of pathological vitality," etc. (Duclaux, Pasteur: The History of a Mind, transl. by E. F. Smith and Florence Hedger, Phila., 1920, p. 229, *Cf.* Gorham, The History of Bacteriology, in A Half Century of Public Health, p. 68). Henle's actual words, formulating his thesis, were as follows: "Ich werde jetzt die Gründe aufführen, welche beweisen, dass die Materie der Contagien nicht nur eine organische, sondern auch eine belebte, und zwar mit

individuellen Leben begabte ist, die zu dem kranken Körper in Verhältniss eines parasitischen Organismus steht," Pathologische Untersuchungen, Berlin, 1840, p. 15. Just what influence these early workers had upon the experimental bacteriologists of the sixties, is difficult to determine. It is a mistake to view Henle, Nott, *et al.*, however, as "closet theorists," merely because they were not laboratory workers. The writer, therefore, cannot at present agree with Duclaux (Pasteur, p. 225, ff.) that their work had no significance. It would require considerable investigation to substantiate such a statement.

64. Nott, Josiah C. Yellow fever contrasted with billious fever: probable insect or animalcular origin, etc. *New Orleans M. J.*, 4: 563–601, 1848; cf. *A. M. A. Trans.*, 1: 79, 1848. For the subsequent history of the study of mosquito transmission of yellow fever, and malaria, see Howard, L. O., A fifty year sketch history of medical entomology, A Half Century of Public Health, pp. 413, 414, 417–423. Graphic descriptions of the final work of the Reed Commission are given in Paul De Kruif's Microbe Hunters, N. Y., 1926, pp. 311–333.

65. Duclaux recognizes that Pasteur can claim no particular preeminence, so far as proving the existence of pathogenic bacteria is concerned. He claims, however (Pasteur, p. 232), that the French genius had no precursor in realizing that medical treatment should act upon the bacterium, rather than upon the man.

66. Rubner, *op. cit.* pp. 38, 39; Gorham, *op. cit.*, p. 69; Duclaux, Pasteur, pp. 225ff. In addition to consulting these and other authorities, the writer has been advised by Col. Fielding H. Garrison, and Prof. M. P. Ravenel, in the preceding comments on Pasteur.

67. A convenient list is given by Gorham, *op. cit.*, pp. 71, 72.

68. The contrast between the old and new etiology is clearly stated by C. V. Chapin in History of preventive medicine, *J. A. M. A.*, Jan., 1921, *passim.*

69. As in the use of toxin-antitoxin to prevent diphtheria, and of antitoxin to cure.

70. Engineering science made possible the urban water systems introduced, in American cities, chiefly in the forties and fifties. Purification filters began to be constructed from about 1880 on; Whipple, G. C., Fifty years of water purification, in Half-Century of Public Health, pp. 163–167. Sewage and solid refuse disposal have a history of their own. The introduction of water systems produced sewage, but there was a lag in the construction of sewers; even the large American cities being very inadequately supplied in the antebellum period. See *Proc. 3rd Nat. Quar. & San. Conv.*, Boston, 1859, *passim;* and Hering, R., Sewage and solid refuse removal, in Fifty Years of Public Health, pp. 181ff.

71. There is an interesting discussion of this aspect of public health progress in W. T. Howard's *Public Health Administration and the Natural History of Disease in Baltimore*, Wash., 1924, pp. 97–104.

72. Few studies of the history of American state health administrations have been published. The outstanding work is Whipple's history of Massachusetts (note 24). See also Rawling's study of Illinois (note 19); Lotspeich, J., The Development of State Control of Public Health in North Carolina, unpublished M. A. thesis, Duke University, 1928; Peabody, S. W., Historical study of legislation regarding public health in the states of New York and Massachusetts, repr. from *J. Inf. Dis.*, Suppl. No. 4, Chicago, 1909. Brief accounts of recent developments in health administration in certain states have been issued in the *Pub. Health Rep.* of the U. S. Public Health Service. General accounts of modern state health law and administration are contained in Mathews, J. M., Principles of American State Administration, N. Y., 1917, pp. 374–400; and in Wallace, S. C., State Administrative Control over Cities, N. Y., 1928, chap. 4.

73. See note 24.

74. A comprehensive picture of present state and other public health activities, is given in Moore, H., Public Health in the United States, N. Y., 1923.

75. The popular mind is still relatively

indifferent to disease prevention, as compared with its other vital interests; and it is still true that only serious epidemic diseases, or those presenting obvious superficial lesions, will arouse a popular demand for control. The average American community, to this day, will voluntarily tax itself to build more churches than are required by social needs, but will oppose any government tax increase to control the unseen tuberculosis in its midst. Yet we condemn the medieval mind for having exalted soul at the expense of body!

76. Leigh, Federal Health Administration, pp. 467–483; S. W. Abbott, Past and Present Condition of Public Hygiene in the United States, Boston, 1900, pp. 14–16.

77. CUMMING, H. S., The U. S. quarantine system during the past fifty years, in A Half-Century of Public Health, pp. 122, 123.

78. Leigh, *op. cit.* chap. 9; Hoffman, F. L. Medical problems of our Indian population, *Bull. 5, East. Asso. Indian Affairs Inc.* 1925; Connolly, V. L., The cry of a broken people, *Good Housekeeping*, 88: 30ff., 1929.

79. GORHAM, F. P., The history of bacteriology, in *A Half-Century of Public Health*, p. 71, Howard, L. O., A fifty year sketch history of medical entomology, *ibid.*, pp. 415, 416.

80. W. H. Welch (Public Health in Theory and Practice, pp. 3, 4), considers Sedgwick's work, and the establishment of a permanent laboratory by the New York City Board of Health, as the chief American contributions to public health work.

81. American relations with European science remained intimate, of course; indeed were fostered by the international health congresses, at which the United States has been regularly represented, but the relations became those of a co-equal, rather than of a provincial dependent.

82. There is a large and accessible literature on all of these phases of the health movement, which it is unnecessary to list here.

83. That there was a variable factor involved in the degree of virulency, has been more or less realized since Sydenham's time. See Chapin, C. V., Changes in type of contagious disease, *J. Prev. Med.*, 1: 1–29, 1927. The variable factor involved in the human host has received more attention since the evolutionary hypothesis emphasized "the survival of the fittest," which seemed to offer an explanation of the apparent existence of so-called racial immunities. Races seemed, perhaps by this process of survival, to achieve a relative immunity to domesticated diseases, e.g. the white to measles, the negro to yellow fever. While there has been a tendency of late to discount apparent racial differences of this sort, as being really due to environmental factors, the existence of a racial factor is probable in at least certain cases. Where the negro, living under inferior conditions, nevertheless exhibits a lower morbidity or mortality rate, a racial immunity or resistance would seem to be indicated. This is the case in a number of diseases. (See Dublin, L. I., The health of the negro. *Ann. Am. Acad. Polit. & Soc. Sc.*, 140: 83–85, 1928. Certain phenomena presented by infectious diseases in the last century suggest that various biological influences may have been at work; e.g., some authorities claim that the correlation between health work and disease decrease has been by no means complete, some diseases decreasing, as it were, of their own initiative. See, e.g., Brend, W. A., Health and the State, N. Y., 1917, chaps. 1, 2, *passim.*

84. See Sedgwick, W. T., American achievements and American failures in public health work, *Am. J. Pub. Health*, 5: 1103–1106, 1915; and Rittenhouse, E. E., Increasing organic disease—the new public health problem, *ibid.*, 5: 1130; 1131, 1915. It is a curious fact that this is not the first period when considerable optimism concerning disease decrease has obtained; note Roberton, J., Medical Police, etc., ed. 2, London, 1812, 2: 29; Webster; N., Epidemic and Pestilential Diseases, Hartford, 1799, 2: 258ff.

85. The serious inadequacy of medical facilities and service in the United States today, is carefully analysed by Harry Moore in American Medicine and the People's Health, N. Y., 1927, *passim.*

NINIAN PINKNEY, M.D. (1811-1877)

SURGEON, UNITED STATES NAVY

By FRANK LESTER PLEADWELL, CAPTAIN, M. C., U. S. N.

WASHINGTON, D. C.

PART I

THE interest that attaches to the life of a notable man is generally very complex; it entwines itself with the great events which our hero helped to bring about, his personal relations with the other great men of his time, and his view of the movements agitating society. And then there is a further interest in his private life. We desire to see the secret sources from which he drew the inspiration he carried into the outside world; we are anxious to know whether he was most real when before the public, and made his inner life subserve his outer, or whether he withdrew from the dust of battle and the rush of the world, into the quiet of his own circle, feeling that he was returning home. All these varying moods are an attractive study; when the mask falls away and we know that he was most dispirited when he seemed most serene, or in reality buoyed up by a divine elation when apparently crushed by a sorrow that seemed irreparable—the disentangling the central strand from the variegated web is a task of fascinating difficulty.[1]

Born in Annapolis, Maryland, on the seventh day of June, 1811, Ninian Pinkney was singularly fortunate in his parents. Both father and mother were cultured and refined, and both possessed qualities of heart and mind which most favorably influenced the up-bringing of their three children.

In the distant past tradition locates the place of origin of the Pinkney family in France, at a little town in Normandy called Picquigny, from which evidently they derived their name. The Pinkneys are stated to have gone to England at the time of the Norman invasion under William the Conqueror, settling first in Durham, from which place in early colonial days two branches migrated to America; one, the Pinckneys, going to South Carolina; the other, which dropped the "c" from their patronym, to Maryland. The subject of this sketch descended from the Maryland branch of the family.

Jonathan, Ninian Pinkney's paternal grandfather, established his home in Annapolis. In the Revolutionary War, adhering to the Royalist cause, he suffered confiscation of his property but, with the restoration of peace, partially recovered it. Jonathan Pinkney was twice married. It was from the second union that the subject of this memoir came. Of the three sons who were the offspring of this marriage one, William, became the distinguished lawyer, statesman and diplomatist; another, Jonathan, remained in Annapolis and was for many years cashier of the Farmer's Bank of Maryland; while the third, Ninian Sr., the father of Dr. Ninian Pinkney, honorably and faithfully filled for thirty years the position of Clerk of the Council, an office of considerable responsibility in the executive branch of the State government.

Ninian Pinkney, Sr., served with distinction in the War of 1812, rising to the rank of lieutenant-colonel, and had achieved, before the war, some success as a writer. Of his work entitled "*Travels through the South of France*" Leigh Hunt said: "It set all the idle world to going to France to live on the charming banks of the Loire."[2]

Ninian Sr., died in 1824, and therefore the greater share of responsibility for the rearing of the children fell to the mother. There were three children, Amelia, William and Ninian. Amelia died unmarried, in Annapolis, in 1918. William, in 1870, became the Protestant Episcopal Bishop of Maryland. He died in 1883. This brother exerted a powerful influence on Ninian's career, second only in importance to that of his mother. Ninian's mother was Amelia Grason of Talbot County, Maryland, and the sister of William Grason, the first governor of Maryland to be elected under the amended state constitution (1838).

Amelia Grason Pinkney, was a woman of gracious mien and superior mentality. She is said to have lacked marked personal beauty, but her intellectual gifts, charming manners and melodious voice more than outweighed such a deficiency. She was devoutly religious, and this tendency is revealed both in her letters and in the poetical compositions which she wrote from time to time. The proclivity for writing poetry seems to have been quite characteristic of the times, and particularly so of members of the Pinkney family, few of whom refrained entirely from indulging it, and some of whom became distinguished as poets of merit.[3] The one least inclined in this direction was Dr. Pinkney himself, but, as we shall see later, even he took to verse on one occasion.

Ninian was the youngest of the three children, and was born in the large brick house on Maryland Avenue, Annapolis, just opposite the Samuel Chase house, or Lloyd house, as it is called at present. This house, which was afterwards owned by the Lockerman family, and latterly known as the Harwood house, still exists in an excellent state of preservation, and remains one of the finest examples of the architecture of the period, especially beautiful in the details of its doorway.[4] In 1812, when Ninian was a year old, the family moved to a smaller dwelling, a plain frame cottage, adjoining old Fort Severn, which Ninian, Sr., had purchased as a permanent residence. This cottage became the home associated with Dr. Pinkney's early life, and remained the abode of his mother and sister for many years.

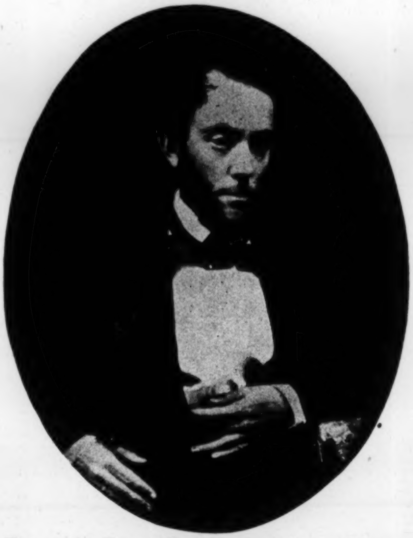

FIG. 1. AN EARLY PORTRAIT OF NINIAN PINKNEY, M. D. SURGEON, U. S. N. (FROM A DAGUERREOTYPE IN THE POSSESSION OF MISS HELENA L. PINKNEY.)

In 1845 Fort Severn and much of the adjoining property, including the Pinkney holding, was acquired by the government as a site for the Naval Academy, but out of regard for the then aged Mrs. Pinkney, she was allowed to remain in undisturbed possession until her death in 1858. The house continued to be occupied by the daughter, Amelia, until May 1, 1859. In 1860 the Pinkney cottage was removed, and in 1868 the first Naval Academy Chapel was built on its former site. Subsequently when the chapel disappeared, the present Superintendent's house was placed where the Pinkney cottage once stood.

Ninian's early education was received at home from his parents. When it came to the question of his academic instruction, it was to be expected that St. John's College should be the institution selected, for it was in good repute and stood but a few blocks from the Pinkney cottage. So, in 1822, when he had passed his tenth birthday, Ninian was entered in the St. John's Grammar School and School of Humanities, and admitted to the School of Philosophy, or the College proper, in 1828. The curriculum of the College at this date is not known. Presumably, it followed that of other colleges of the day, and comprised philosophy, mathematics and the classics. The academic course ran two years, and it was on the twenty-second of January, 1830, that Ninian received his Bachelor of Arts degree.

His diploma is still extant, and in the list of professors who signed the document appears the name of Edward Sparks, M.D. Dr. Sparks was an example that class of medical men not uncommon in his day but rare enough now, who combined medicine with classical learning. He possessed the dual distinction of being both a professor of ancient languages on the St. John's faculty and a successful practitioner of medicine.

Perhaps through the influence of Dr. Sparks, soon after his graduation Ninian decided to study medicine, and, in accordance with the prevailing custom, entered the office of his old preceptor. Here he acquired a knowledge of the rudiments of medicine, received bedside instruction, and seems to have won a well-deserved reputation for industry, perseverance, and thoroughness. There is evidence that he supplemented his instruction at Annapolis by attendance on medical lectures at the University of Maryland, in Baltimore, but we know that not later than the Fall of 1831 he had matriculated at the Jefferson Medical College in Philadelphia, for in October of that year his mother wrote:

> The youngest and gayest [Ninian] first went forth. His destination was to a sister city [Philadelphia], to attend lectures in the healing art, in the practise of which I have in these latter days the pleasure of regarding him as proficient. We felt in this parting, that he would come again in spring to cheer his widowed mother and his only sister.

Ninian Pinkney received the degree of Doctor of Medicine from the Jefferson Medical College on April 8, 1833. During his course of study he came under the spell of those brilliant and eloquent medical teachers, George McClellan and Granville Sharp Pattison,[5] holding the chairs of surgery and anatomy, respectively. The young medical student became a sincere admirer of these men, and by Pattison especially this sentiment appears to have been reciprocated. Bishop Pinkney, in the memoir of his brother which he wrote in 1878, refers to this association, in these words:

> He there at Jefferson enjoyed the privilege of sitting at the feet of Granville Sharp Pattison and George McClellan. . . . As he drank in the marvellous eloquence of Pattison, and marked the not less marvellous skill of McClellan, he grew imperceptibly into the likeness of the men he so much admired. Pattison he considered the prince of lecturers, the mightiest orator of his age.
>
> It was his custom once a week to summon to his hospitable mansion his young students, and to discuss with them the mysteries of their noble science; and it was there that he threw over them the spell of his peculiar fascination. In these informal interviews, as in the classroom, he was quick to discern the genius of the young man . . . Pattison was proud of him, and he showed it in many ways, but in no way so remarkable as in designating him in after years as one who was qualified to fill the chair he occupied, and in making provision that his library should pass into the possession of his former pupil at a nominal price, if he so desired. That library was Surgeon Pinkney's at the time of his own death.[1]

From April 8, 1833, when Ninian Pinkney graduated from the Jefferson Medical College, to February 1, 1834, when he appeared before a board in Washington for examination for admission to the Medical Corps of the Navy, there is no record of how he spent his time, nor is it known exactly what influences led him to enter the Navy. Perhaps the glamour of travel which that profession was said to offer, and the certainty of a steady income, were incentives to this course. At any rate a letter addressed to him on December 16, 1833, in care of the Hon. Isaac McKim, House of Representatives, gave him the necessary permission to be examined, and, as his brother relates, "at his examination, as no question asked was missed, he was returned second on the list."

Having reported to the Hon. Levi Woodbury, Secretary of the Navy, that his place of residence was Annapolis, and requested that his commission be sent to him there, he returned home to await its arrival, and the expected orders to duty. His commission bore date of March 26, 1834, and on May 12th his first orders were issued. These required him to report as the junior surgeon of the *U. S. S. Erie*, then fitting out for a cruise in the waters of South America.

Unfortunately no record of his impressions of this cruise nor information of its events has been found in available correspondence or elsewhere. That he wrote home to mother, sister, and brother can hardly be doubted, considering his habits of later years, when his letters invariably contained most voluminous descriptions of the places visited, and carefully related all outstanding occurrences.

During the cruise he was elected an absent member of the Naval Lyceum, and probably benefitted from one of the objects of this society which was to take charge of and forward letters to foreign stations.[7]

One incident alone of this period, and that unfortunately a disagreeable one, is reflected in official letters. The first echo of this affair is found in a letter written to the Secretary of the Navy by Dr. Pinkney, after his return home to Annapolis from the cruise. It appears that on December 2, 1836, while the *Erie* was in Montevideo, the doctor was placed under arrest by Commodore James Renshaw on charges of disobedience of orders and treating with disrespect his commanding officer. Certainly these were serious charges; nevertheless, by the third of January, 1837, he was restored to duty on the ground that his services were needed by reason of an increase of sickness on board, and apparently he was never rearrested, or brought to trial for the alleged offenses. The circumstances giving rise to the charges are not known, but that he made an insistent demand for an investigation and requested that he be given his "day in court" will appear from the following extract from a letter written by him to the Secretary of the Navy:

> I presume that a statement of charges preferred against me by Com. Jas. Renshaw has been transmitted to the Department . . . If I am correct in this supposition, I shall be indebted to you for a copy of the charges thus preferred. . . . Justice to my own character, which no man, however eminent in office, shall ever wantonly assail with impunity, urges me to make this demand . . . I trust I shall be able to sustain my character . . . At all events I demand a trial by court-martial and when this demand shall be gratified, all that I ask of my country will be granted.

The incident appears to have been closed, but not entirely to the doctor's satisfaction, by a reply to him from the Secretary that no charges had been preferred and that, "when Com. Renshaw shall prefer charges against you they shall receive all the consideration to which they may be entitled."

From September 20, 1837, Dr. Pinkney was granted three months' leave of absence. Part of this leave was spent at Annapolis, but the greater portion of it was devoted to professional study and work in Philadelphia, probably under his former professors, McClellan and Pattison, who were still at Jefferson Medical College, although a year later, in a reorganization of the college, the name of the latter talented but impulsive individual was not to be found in the new faculty. Pinkney's leanings in medicine were very decidedly towards the branches of anatomy and surgery, and, as we shall see later, he attained a very high degree of proficiency and success as an operating surgeon. In pursuance of his plans for professional improvement he was drawn to Philadelphia, then, as now, a great center of medical learning, and also because his connections there gave him unusual opportunities for advancing himself in the branches mentioned. To quote again from Bishop Pinkney's memoir:

> He resolved from the starting point to become an adept in surgery, which is the highest department of the profession. This he knew he could not become unless he was willing and resolved to walk in the footprints of the men who had so illustrated its grandeur. Application and study were the only keys that opened the door of admission into the temple of Fame, and he knew it.
>
> It was the dissecting room with "the Palladian oil" that had developed a Sir Astley Cooper; and to it Pinkney devoted the hours ordinarily given to relaxation and pleasure, week after week. This habit he kept up almost to the close of life . . . In very early life he won considerable reputation for a dissertation on the nervous system,[8] in which he advanced some original views, while his magnetism of manner in delivery gave him a delighted audience in the school of his early training. That paper was condensed logic, and at the time commanded the eulogy of some of the first men in the profession.

After the completion of the leave of absence, there was a visit to his mother at Annapolis, and then the submission of a request for duty at the Naval Hospital in Philadelphia. This request on the part of Dr. Pinkney had the support of his friends and advisors in Congress, the Hon. Isaac McKim, and General B. C. Howard,[9] whom he had consulted in Washington about it.

On April 11, 1838, orders to the much desired duty were received. In a letter of that date from Annapolis we find the doctor writing an acknowledgement of his orders, and stating that he is leaving "in a half hour" for his new post of duty. The expression "in a half hour" reflects the eagerness with which he looked forward to the consummation of his cherished plan for perfecting himself in the principles and practice of surgery, which he calculated the new duty was to give him.

About this time or a little later he became concerned with a more absorbing affair for he was forming an attachment for the lady who was shortly to become his wife. The lady in question was Mary Sherwood Hambleton of Easton, Maryland, daughter of Edward H. Hambleton and sister of the Hon. Samuel Hambleton, of Talbot County, Maryland. The exact date of their marriage is not known, but the following lines from a letter to Miss Hambleton, dated April 9, 1838, written from Washington by Dr. Pinkney, indicate that the happy event was then not far distant:

> To-morrow week and I shall be on that *Shore* [the Eastern shore of Maryland] where *all* that I love most on earth lives; indeed, my *beloved*, you have not for a moment been absent from my thoughts, and that day which is soon to make you mine is hailed with joyous welcome.

He was married, and with his wife returned to Philadelphia and resumed his duties at the Naval Hospital. Little of importance relating to this period of duty is known, for few letters have survived. The loss is regrettable, for Dr. Pinkney was eminently sociable, and he must have added to his friends in that city and had many interesting associations and experiences.

The high spirit which was always an outstanding feature of his character is nowhere better revealed than in a letter which he wrote about this time to the Secretary of the Navy. Unfortunately the text of the letter is too long for full reproduction here. In it he reported a Lieut. J. B. C——, Superintendent of the Building, "for deliberately and maliciously killing a dog while tied in the back yard of this Asylum, the property of the body and faithful servant of Com. John Rodgers." It is not intended to dignify this incident with more than a passing notice, and it is mentioned only because the position taken by Dr. Pinkney on this occasion was characteristic of his attitude in many similar occasions. He bitterly resented a wrong, and was always ready to champion the cause of the injured. As we shall see later his impetuosity often led him into difficulties, which a calmer temper would have avoided. And his attitude was often misjudged by those who knew him but slightly, and who were ignorant of the finer qualities of mind and character which he possessed, with which older friends justly credited him.

In January, 1839, Dr. Pinkney asked to be detached from the Philadelphia station and granted leave, because, as he wrote, "circumstances of weighty consideration incline me to make this request," which rather cryptic reference was explained in a subsequent letter by stating that he wished to be with his wife during her approaching confinement. So he was released from active duty, went to Easton, and enjoyed the society of his young family for a number of months.

In August, 1839, he was ordered to the frigate *Brandywine*, then at Norfolk, where that ship was fitting out for a cruise in the Mediterranean. On the eve of his departure from the country, his brother, who now had charge of two parishes in Prince George's County, Maryland, wrote him a letter, which contains much of value to a study of the subject of this memoir:

Bladensburgh, Sept., 25, 1839.

My dear Brother:

It is probable you will think I have neglected you because I have not written to you since I saw you in [Annapolis] . . . I felt for you the deepest sympathy during the whole of my stay in [Annapolis], for I well know how painful it is to part from a wife and child and other near and dear friends for so long a period as three years . . . There is nothing in a visit to the [Mediterranean] which is not gratifying to a man fond of enterprise and desirous of mental improvement . . .

I know that you will not be an idle spectator, but a diligent [illegible] of all these strange sights. I wish I were able to see them and admire them in union with yourself. Providence has separated us, however, and we must be satisfied . . . I suppose that you will sail before long, and I again wish you a happy and safe voyage. I could not but hope that you would have seen enough of the wisdom and the powers and the beneficence of God in the anatomy of the human system and the wonders of the ocean, to be persuaded to be a Christian, and I still hope that you may be won by the matchless beauty of the Saviour to take up his cross without a moment's hesitation . . .

And now, my dear Brother, will you permit me to press upon your attention, a subject to which you do not attach so much importance as I do, and concerning which you hold some peculiar views. I would advise you as follows. Weigh the advice. If you like it, adopt it. If not, reject it, and forget that it was given. Be *courteous* and *kind* in *your bearing* to all your officers. Never indulge in a *free expression* of *your opinions concerning them.* No one likes to be either ridiculed or spoken of. Have nothing to say about the regulations, government, or organization of the ship. As a surgeon this does not come properly under your notice. Obey cheerfully and promptly every *lawful* order or command. If any order be clearly unlawful, mildly refuse to obey. But no matter how uncivil the mode of giving an order may be, never put yourself in the wrong by a similar breach of courtesy, but promptly discharge your duty, and by your gentlemanly bearing, reprove the tyranny of your superior in station. Nothing is lost by this. You lose nothing of independence. On the contrary you prove that in the regulation of your own temper, when the occasion calls for it, you are capable of self government, and that while you respect authority wherever vested, you will not permit *one inch* of your own privileges to be invaded. You have a gentleman of distinguished talents and noble bearing to deal with in the person of your commander.[10] Recollect the delicate and difficult station he occupies, sympathize with him in all his official troubles and do all in your power to render his time pleasant and agreeable, and you will never regret it.

Your aff. Brother,
W. Pinkney.

Dr. Ninian Pinkney
On board the U. S. F. Brandywine
Norfolk, Virginia.

Bettie sends her love to you and says she wishes she could have had another laugh with you before you sailed. Once more, adieu!

This letter is valuable in conveying an impression, by implication at least, of some of the doctor's failings, and it also reflects the deep fraternal affection existing between the two brothers which endured through life. William's concern for Ninian's welfare, both spiritual and material, is plainly revealed in this farewell missive. Unfortunately, as with most mortals, the good advice proffered was not heeded, and bitter experience was shortly to come and teach the doctor his lesson.

Finally we gather from his brother's letter that Ninian, in spite of his mother's and his brother's influence and example, was not highly imbued with religious feeling, but was something of a "doubting Thomas" still. Some years later in a letter to Mrs. Pinkney, he conveyed a message to the daughter which indicated that he was overcoming his indifference to religious influence. This letter was written from the *Albany*, on December 14, 1846, and the message to the daughter Amelia runs as follows:

> Tell her I continue most faithfully to keep true to my promise, and have read St. Matthew and a greater part of St. Mark, and I feel improved by it. She must be a good little girl and the day may come when she may be the instrumentality of converting her poor sinful father.

The first months of the cruise passed most pleasantly. One of the few surviving letters which he wrote to Mrs. Pinkney gives us a picture of his way of life at sea at this time.

No. 13 U. S. Frigate Brandywine,
Nov. 4, 1839.
At Sea, Lat. 34–50, Long. 49–14.

My dear Mary:

It has been a long time since I had the happiness to receive a letter from my beloved one and that she may not be doomed to suffer the same disappointment I have considered it best to commence writing during our passage to Madeira. When we reach there an opportunity will probably present for sending our letters to the United States . . .

I shall give a short detail of our passage thus far, which although fraught with incidents of mere commonplace, will no doubt prove of interest to you. We are half way to Madeira and should have been much further but for a head wind which blew quite a gale for nine days. It then came out fair and continued so for a week, which enabled us to average per day about 170 miles. Our ship sails remarkably well, and under close sail has gone off 11 miles per hour. A heavy swell has been thrown up which causes our beautiful ship to roll heavily under her press of canvas and being before the wind renders it most uncomfortable. For a day or so we experienced quite a gale, which produced so much motion as to make most of our officers sea sick and their sufferings were such as to call forth the hearts commiseration. I was fortunate in experiencing no inconvenience on this account, and my health is greatly improved . . .

There are on board two asst. surgeons, Docts. Sinclair and Magill; the latter takes passage to the Mediterranean to join the *Cyane*. They are both polished men, and occupy in their profession a very respectable stand, and as for myself I entertain the highest regard for their character. It is a great privilege to be associated with men of such pleasing and courteous manners, and we live together more like relations than accidental acquaintances . . . We are all close students, and after getting through with the day retire to the sick bay, where we read until 12 at night, then we separate to our respective rooms, and I dream of the many happy days you and I have passed together, indulging the hope of one day being restored to the bosom of her to whom I owe so much happiness.

Time passes rapidly to me, owing no doubt to close occupation. As it will probably be many years before I can visit the Mediterranean again I have determined to spare no pains in embracing all opportunities for improvement, and shall cultivate a knowledge of the Spanish and French languages; they are accomplishments well worth attaining and add greatly to the reputation of a professional man. To a physician they are indispensable, for the best medical authors are made up of the French. I anticipate in a few years making Philadelphia my field for operation, that is, as soon as I can succeed in getting orders to the Rendezvous. Then I shall have an excellent opportunity for trying my prospects there and after remaining the usual term of two years . . . I can decide whether or not it would be prudent to remain. It would be absolute madness for a man of my years and reputation (no matter what experience I may possess) to enter upon so important a step without weighing well all its points.

I have warm and influential friends there, men who occupy the most distinguished stand, who have expressed themselves willing and even desirous of advancing my laudable ambition.

Nov. 28th. In sight of Mahon. Farewell.

Your affectionate husband,
Ninian Pinkney

Mrs. Doctor Ninian Pinkney
Easton, Talbot Co., Md.
U. S. No. Am.

All seemed well with Dr. Pinkney and his affairs, if this letter can be accepted as a criterion. Happily employed, concerned with cultural self-improvement, and formulating ambitious plans for the future, there was no sign of the storm shortly to break over his head. Nevertheless, in two months we find him haled before a court-martial charged with "disrespectful and provoking language to a superior," and, "conduct unbecoming an officer and a gentleman." The charges were preferred by Surgeon James M. Green, his medical superior, and the court was held on the *Brandywine*, at Port Mahon, January 7, 1840.

The charges appear to have arisen in connection with a discussion over a professional question, namely, whether or not a fractured collarbone under examination in the sick-bay of the *Brandywine* had united by bony union. Dr. Pinkney's views of the case differed from those of his associate, and were treated with disdain. This attitude on the part of the senior surgeon aroused the resentment of the junior surgeon, which no doubt found expression in words. There were other questions involved, duly set forth in the specifications, but they possess a character which makes one feel that the whole affair was something of "a tempest in a tea-pot." Probably under happier conditions, they would never have been made the basis for charges. The decision of the court was, "guilty of disrespectful and provoking language:" "guilty of conduct unbecoming an officer," but "not guilty of conduct unbecoming a gentleman." The sentence involved suspension from duty for eight months, dismissal from the squadron, and transfer home.

The findings being duly approved by the Squadron Commander, Commodore Isaac Hull, the young surgeon started home, not, however, by the direct route by sea, but by way of the continent and England, for Commodore Hull decided to utilize Pinkney's services to carry important despatches (concerning the Oregon question) to the Hon. Andrew Stevenson, then United States Minister to the Court of St. James. This mission detained the doctor in London for several weeks. He was thus afforded an opportunity to see that city, become acquainted and form friends, particularly among the medical profession. Foremost among these friends was the celebrated surgeon, William Fergusson. Here is Dr. Pinkney's account of the meeting with Fergusson and with some of the other well-known surgeons of the day in London:

> The first time I had the pleasure of seeing Sir William Fergusson was in the Spring of 1840. He had then just established himself in London. Immediately after my arrival in London, he introduced me to Sir Astley Cooper, at whose hands I received great attention and kind hospitality. It was at a dinner party at Sir Astley's that I formed the acquaintance of Sir Benj. Brodie, Sir James Clark, (Physician to the Queen), and Mr. Fergusson. It was a consultation dinner so far as the three first gentlemen were concerned, Sir Astley having retired from active practice. The consultation was as to the propriety of disarticulation at the hip-joint in the case of an eminent citizen of London, the gravest operation known to the profession. Liston was to operate. Mr. Fergusson and myself were invited to be present. The operation was performed by Liston, Sir Astley Cooper being the guiding genius in the case. I had frequent opportunities of visiting the patient after the operation, which proved successful.[11]

It was not until April 24, 1840, that Dr. Pinkney arrived in New York from England and reported his return to the Navy Department, indicating in his letter his intention to proceed from New York to Annapolis. From Easton, on October 12th, he called attention to the termination of his period of suspension, and requested orders to the frigate *Constellation*. No detailed information of the doctor's activities during these months of suspension from duty has become available, and we can only conjecture what he did and how he passed his time. Considering his energy, and his enthusiasm for surgery, it is not likely that he remained idle at Easton and Annapolis during all of this period. The success which he was shortly to achieve in the practice of surgery leads one to believe that he must have spent a good portion of it following the clinics in Baltimore and Philadelphia, working in the dissection room, and even operating on patients whenever a friendly professor gave him the opportunity.

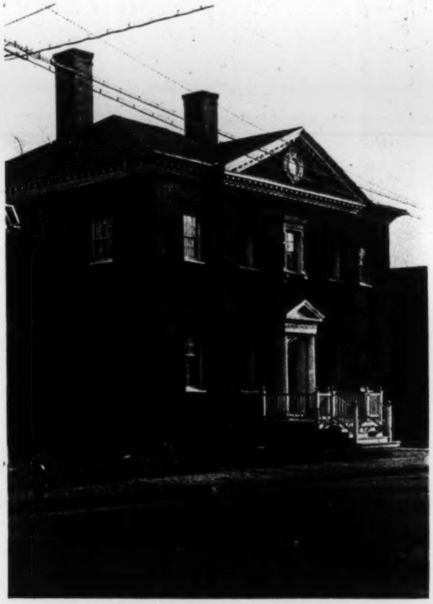

FIG. 2. THE PINKNEY-LOOCKERMAN-HARWOOD HOUSE, ANNAPOLIS. (KINDNESS OF E. H. PICKERING, ANNAPOLIS.)

The next duty to which Dr. Pinkney was ordered took him to the West coast of South America. He was at

Rio de Janeiro on February 5, 1841, at Valparaiso on April 5, and at Callao, his destination, on the twentieth of April.

A letter to his wife from Rio gives a description of the magnificent harbor, tells of gayeties ashore, and then continues in a rather dejected strain:

> But amidst all this earthly happiness a blank was made which none but yourself and my precious darling could fill up. I would give a good deal if it were so that time and distance could not separate us, whose sole happiness is dependent on each other . . . After a lapse of a year or two, I shall, if heaven will it, be once more restored to the bosom of my family with a mind more tranquil, and a *purse better filled*, which will leave me at liberty to follow the guidance of my judgment unfettered; I have no fear of rising in my profession in Baltimore, and it is my intention of making trial there.

Soon after arrival at Callao, Peru, the doctor was assigned as surgeon of the station ship *Relief*. Callao was in these days a port of call and a base of supply for the large American whaling fleet in the South Pacific, and this fact, coupled with the then unsettled relations with Mexico and England, made the presence of United States naval vessels advisable on this coast. As a consequence of these conditions the port of Callao had become the rendezvous for the naval force, and Dr. Pinkney was destined to remain here for several years. Quotations from a few of his letters of this period will give us an idea of how he was employed. Letters required months of time to pass between Easton and Callao, and this condition of delay was a cause of much dissatisfaction both to the doctor and to Mrs. Pinkney. It was *eight months* before Dr. Pinkney received his first letters from home!

> My position [on the ship] is peculiarly pleasant to me and as far as that is concerned I have every reason to be contented. I am perfectly well and have some little practice on shore for which I shall receive some compensation . . . In reference to our affairs with England matters appear to have assumed a serious aspect. I have always from principle been opposed to war, and every true lover of liberty must be, but at the same time I would rather see my beloved country scourged with war, than for a moment allow herself to be trampelled upon by proud and arbitrary England[12] . . .
>
> I am in ignorance regarding you all . . . Soon after the *Constitution* sailed I was sent for to attend some sick on board of a whaler, and upon leaving was presented with a Dubloon, quite a handsome present, and I must say an unexpected one. Two of his sailors were left in port under my attendance, and when he came in for them he gave me two more ounces, making in all $54.00. It is true that my professional services were well worth the amount, but what I received far exceeded my expectations. Both cases were difficult to treat, one of them having received some injury of the lower part of the back which deprived him partially of the use of his lower extremities. I attended them ten days and returned them as cured. For attendance on the mate of another vessel I was compensated $8.00. My success in the treatment of these cases induced a poor sailor who had a large tumor situated behind the ear to request me to operate. I examined it and understood from him that he had wished the Surgeon of an English frigate some years previous to cut it out, but he declined doing it. He said that it had been growing for twenty years, and within the last year it had doubled in size. I requested him to come on board the next day; he did so, and with Capt. Nicholas's permission I com-

menced the extirpation of it. Its size was that of a large lemon and entirely disfigured the appearance of the man. The upper portion of it was just below the lobe of the ear, and the lower part of it extended to the middle of the cheek. I made an incision over the anterior face of the tumor six inches in length, then detached it from its connections, which were deep-seated and involving important parts. The large artery of the neck (called the carotid) pulsated strongly under my finger, and it required the most delicate dissection to avoid injuring it. The superfluous skin was cut off and three stitches made use of to keep the lips of the wound in contact. Compresses and bandages were then applied and due pressure kept up. To-day is the tenth since I operated and the result has been all I could have wished, perfectly successful. I have performed two other operations on shore besides this and both have succeeded. I am not disposed to speak in praise of myself, but as the operation has gained me considerable reputation throughout Callao and Lima, I have thought fit to mention it.

The successful outcome of the operation just described, namely the removal of a large steatomatous tumor situated over the carotid artery, which was performed on Juan de Arenales, a prominent merchant of Lima, attracted much favorable notice locally and as a result many patients came to consult Dr. Pinkney. As is not uncommon in countries where surgery is still at a primitive level, many of these patients presented surgical conditions in their most aggravated form. Nothing daunted, Dr. Pinkney assumed charge of them and operated whenever there appeared to be a prospect of improvement by so doing. He had arrived at Callao on the twentieth of April, and by the twenty-ninth of November he had performed 41 operations, chiefly of a major character. Among these were the following: Ligation of the femoral artery for popliteal aneurysm; extraction of a musket ball lodged immediately over the great sciatic nerve, for paralysis of the lower extremity, of two years' standing; removal of a scirrhous carcinoma of the lip; excision of the elbow joint; trephining of the skull for epilepsy; excision of the head of the humerus; ligature of the subclavian artery and disarticulation at the shoulder joint; and excision of the lower jaw for osseous tumor.[13]

When it is realized that this surgical work was done without an anesthetic, and with no advantages of asepsis as we know it now, with the loss of but one patient, and with material success in all the others, we must accord great credit to Dr. Pinkney's surgical acumen and skill.

It was not until 1847 that Sir James Y. Simpson introduced chloroform, and the oracular pronouncement of Velpeau in 1839, only two years before the date of these operations, had been, "To escape pain in surgical operations is a chimera which we are not permitted to look for in our time." Even the use of anodynes or any of the other methods employed in pre-anesthetic days for obtunding sensation, were discountenanced by Dr. Pinkney, for in a detailed account of the operation for excision of the head of the humerus, he explicitly states, "no anodyne having been administered, as I am much opposed to such precautionary steps."

The asepsis of operations of this period was only relative in degree and accidental in character, for Lister's first results were not published until 1867, yet healing by first intention appeared to be the rule, and not the exception, in Dr. Pinkney's cases.

In speaking of his brother's surgical success at this time Bishop Pinkney says:

> In Lima and Callao, the doctor won for himself, in an incredibly short time, the most enviable reputation for skill in surgery and the practice of medicine. So large was his practice, that Mr. Dorr, at that time representing our country at Lima, told me, that there would be a line of carriages headed by the coach-in-four of the Bishop of Lima, and the Governor, drawn up before the hotel, forming a pageant so novel as to be the wonder of all eyes.
>
> Mr. Pickett, a well-known citizen of Washington, a powerful writer and an accomplished statesman, fully confirmed all that Mr. Dorr said. The former told me that Surgeon Pinkney was offered one hundred thousand dollars if he would consent to remain at Lima and Callao. . . . He stands identified with an important invention in surgery, and that too, as the inventor. Dr. Pinkney advanced the idea, and acted on it months before it was adopted elsewhere. The proof conclusive of this fact is in my possession, and I now submit it to the public for the first time.
>
> My dear Doctor: January 11, 1873.
>
> I cannot allow you to retire from the active service of the Navy without expressing to you the high estimate I place on your skill as a surgeon. In 1843 it was my pleasure to be present when you removed a portion of the lower jawbone from a young man in Lima. The fleet surgeon of the French fleet was present on the occasion. The question arose as to the mode of operation. The usual plan as laid down by eminent surgeons, as Sir Astley Cooper and Velpeau, was to make an incision along the lower portion of the jaw, and then carrying the incision to the corner of the mouth. I recollect well that you did not approve of this mode of operation, for two reasons:
>
> First, that the operation would be unseemly. Secondly, the division of the seventh pair of nerves would mar the expression of the face and leave an ugly scar. For the first time in surgical history you made a curvilinear incision below the border of the jaw and extended it to the middle of the chin. By this mode of operation there was no disfigurement, and the operation was performed in a manner which elicited commendation at the hands of the French fleet surgeon, who had been a pupil of the celebrated Velpeau of France. The palm of originality was accorded to you and you richly deserved it.
>
> Wm. Johnson, Med. Director,
> U. S. Navy.

A native custom prevailing on the Peruvian coast was the making of metal models of various objects, and utilizing this practice, the doctor had casts or models made of some of his pathological specimens, tumors, etc., one of which has survived.

Finally letters began to come through to Callao from home, with news of the young daughter, to whom he refers in his letters in terms of endearment as "puss-cat," "little darling," "little pussy," and "lisping daughter." Mrs. Pinkney's letters tell him of local affairs in Easton and Annapolis, comment upon the political events of the day, and give him news of the naval service. Included in the latter category is a reference to Surgeon Green, his complainant before the court at Port Mahon in 1840. She says:

> The trial of Lt. Richard S. Pinkney terminated on Sat. last . . . The accuser of the Lieut. was Surgeon Green, and a most "green" and impotent business he made of it. . . His testimony was contradictory, ridiculous, and most palpably induced by malice. Suffice it to say that he sealed his own disgrace . . . I knew you would like to find that old Green had got himself in a scrape and that his

true character had at last been brought to light . . . Your mother says that Capt. Buchanan[14] told Mr. Hobbs that Captain Bolton spoke very highly of you and said that Dr. Green had been the means of depriving him of the services of two fine young men, meaning yourself and another.

Dr. Pinkney was by nature most generous as well as prodigal. The money that came easily, went as easily. We shall see from the following extracts from his letters to Mrs. Pinkney how soon, and in what manner his savings were dissipated:

> Callao, Nov. 29, 1841.
> My dearest Mary,
> I have a few moments left me to write to you by a whaling vessel bound direct to Nantucket . . . I am much occupied professionally and have to this date made exactly one thousand dollars. My practice averages daily ten dollars and if our ship remains in this port six months longer I shall have something worth bringing home, enough to buy furniture and other articles of house-keeping without drawing upon my pay or being under an obligation to any living being.

On May 30, 1842, he wrote:

> I had the happiness to receive many letters from yourself and my mother . . . I send you a box containing all my articles of value . . . I am sure that you will be delighted with them. The gold chain and seals are a present for my brother Wm. The remainder is for my beloved wife . . . I have sent money to England to purchase a tea set of silver . . . Be kind enough to send Ma the sum of $100, and say it is a present from me . . .

In Mrs. Pinkney's replies there is at first a note of admonition over these extravagancies, but forgiveness and appreciation when the presents are received at Londonderry.[15]

Dr. Pinkney's resolutions for economy are often reflected in his correspondence, but he was seldom successful in putting them into practice. In a letter written in 1846, while attached to the *Albany*, just after the ship had left the port of Havana, the following occurs:

> I shall be very economical this cruise and you must not consider my purchase of cigars at Havana as a bad beginning. I spent money on that occasion as I knew we should not have another opportunity. In other respects I was highly economical.

The following letters from the United States diplomatic representative in Peru reflect the high esteem in which Dr. Pinkney was held in Lima, not only for his personal qualities, but also for his professional abilities, and they also give us an estimate of his social standing with his fellows:

> August 1st, 1843.
> Dear Doctor:
> The Commodore informs me that I shall have the pleasure of his company at dinner on Thursday next. You must not fail to come, being a *sine qua non*. I wish about six or seven to come from Callao if that number can be had, the three captains, Mr. Howison and Mr. Willis, besides the Comre and yourself.
> Yours,
> J. C. Pickett[16]

> Private. Lima, Aug. 7th, 1843.
> Dear Doctor:
> I enclose two letters. Through Mr. Blair you can become acquainted with sundry distinguished Democrats, should you be much about Washington. I hope I shall see you back here with the Commodore, and that he will keep you on this station, "by hook or crook," until the "U. States" goes home, at all events, or longer.

I think it would be a good plan when the Comre returns for you to get leave of absence for three months—establish yourself in Lima for that time and see what you could do, giving all your time to practice. You will be much missed here, both by your friends and your enemies, particularly by English bullies and fire eaters, who will begin to crow again, I expect, when they learn that you are certainly gone. Do not forget the letter published in the U. S. about my *counsel* to Comre Jones.

Yours always by land or water,
J. C. Pickett.

On June 24, 1844, after over three years very successful duty at Callao the doctor was detached from the *Relief* and ordered to the Receiving Ship at Baltimore. His former commanding officer on the *Relief*, Capt. Nicholas, had preceded him to Baltimore, and this fact may have determined the selection of Pinkney, for his relations with Captain Nicholas at Callao had always been most harmonious; but other reasons for desiring this duty weighed with him. These will appear from reading a letter dated May 22, 1844, written from Annapolis to the Secretary of the navy:

I have just returned from a long cruise in the Pacific, and hearing that the Baltimore Station is to be opened, powerful reasons induce me to apply for it; could my request be granted I should be located amongst friends and family, and enabled to perform public duty without sacrificing private feelings, which is very desirable, and I think not unreasonable after a very long cruise of laborious service.

The duty at Baltimore placed him near his wife's home at Easton and not far from his mother at Annapolis. Furthermore his brother was still at Prince George's County, Md., and so within a short distance from Baltimore. The usual source of information regarding the events of Dr. Pinkney's life fail us now, for no personal letters relating to this period have been located. In June, 1846, he seems to have anticipated sea duty, for a letter has been found from the Hon. George Bancroft, then Secretary of the Navy, to the Hon. Reverdy Johnson, showing that the latter had been instrumental in securing the promise of active sea service for the doctor. Dr. Pinkney wished to go to the new Sloop of War *Albany*, and addressed an inquiry about the ship to his friend Capt. Eagle who replied as follows:

New York, June 16, 1846.

Dear Pinkney:

. . . .

You ask my opinion of the Albany. She is a fine moddle [*sic*] and I have no doubt she will possess all the good qualities that a ship should. She is to be launched on the 27th inst. I hope you will be attached to her for then I may soon have the pleasure of seeing you and your family . . .

H. Eagle.

On the fourteenth of October, 1846, he joined the *Albany*, at New York. The ship appears to have remained on the Atlantic coast for another month, and then to have sailed for the Gulf, for a state of war had existed with Mexico since May 11. Dr. Pinkney was destined to participate in the blockade of the Mexican coast, and to witness the joint Army and Navy operations about Vera Cruz. He was present at the bombardment of that city, saw the landing of the troops under General Winfield Scott, and the taking of the city, and he was an eye witness of the triumphal entry of the United States forces into the city, after the capitulation. During the active operations he offered his services as a surgeon to General Worth, (who had been with his father in the Revolution), and they were accepted, but he failed to gain the consent of his commanding officer to carry out this plan.

Commodore Connor had been the commander of the naval force on the Mexican coast, but was relieved by Commodore Perry, "much to the infinite pleasure of the Navy and Army," as Pinkney remarked in one of his letters. Later, he wrote:

> Com. Perry has been in command but forty-eight hours and I can see evident changes for the better, and there is some hope that the Navy may yet be enabled to recover from the disastrous position in which she has of late been placed.

In making passage to the Mexican station, the *Albany* had stopped at Havana. From this port the doctor, in a letter to his wife, gave a free expression of his views on the war with Mexico:

> Whilst in Havana [December, 1846] a report was in circulation that General Taylor and Santa Anna had agreed upon the basis of a treaty . . . The Mexican War was commenced wrong on our part and it will end much I fear to the discredit of our nation as a republic, in consequence of its having been created in a spirit of conquest and not in the vindication of our rights. It has been, as I have always maintained, a war of invasion, in violation of the constitutional prerogatives, and we will stand [illegible] in the eyes of friendly nations. This was the first time we ever departed from the cherished principles of the Patriots of the Revolution, and where the evil will end, will yet be a matter of history. I am anxious to see the President's message and also to read the action of Congress in relation to the War. Of course he, James N. Polk, will be impeached, there being strong and substantial reasons for it.

In December, 1847, Dr. Pinkney was directed by Commodore M. C. Perry, Commanding the Home Squadron at Vera Cruz, to report to Commander Franklin Buchanan, of the *U. S. S. Germantown*, for temporary duty on that vessel.

Thus began an association with Buchanan, which ripened into a warm friendship, broken only by the onset of the Civil War, when Buchanan became a leader in the Confederate Navy and Pinkney remained with the Union Navy.

The duty on the *Germantown* led to more active service, and Dr. Pinkney accompanied Captain Buchanan in the expedition to Tobasco, and was commended by Commodore Perry for his services in that affair:

> Navy Yard, Vera Cruz, January 14.
> 1848.
>
> Sir: I have great pleasure in expressing to the department, the high opinion I entertain of the professional skill and valuable service of Surgeon Ninian Pinkney, who has relieved Surgeon McClenahan, in the Germantown. I was particularly indebted to Dr. Pinkney, for his exertions and attention to the sick and wounded in the expedition to Tobasco; and I am happy to say that he deservedly enjoys the respect and confidence of every officer and man in the squadron.
>
> I have the honor to be with great respect , sir, your ob't servant,
>
> M. C. Perry.
> Commanding Home Squadron,
>
> Hon. J. Y. Mason,
> Secretary of the Navy,
> Washington.

While still attached to the *Albany*, and during the blockade of Vera Cruz, an incident occurred which awakened his interest in international law, an interest which continued throughout his later career in the Navy. The treatment accorded a blockade runner, the French barque *Felix*, which the *Albany* had very properly intercepted and captured, having been altogether too liberal (she was released by the Commodore), according to the doctor's estimate, he wrote an article on the incident, with a recondite discussion of the law of blockade, which would have done credit to an international lawyer versed in the subject.

In February, 1848, the doctor was detached from the *Albany*, and appears to have gone home on leave for a number of months. At any rate, the next notice we have of his activities bears date of May 1, 1848, when he made a strong appeal for duty at Annapolis. He desired to have the place on the Navy Board at the Naval Academy, when it became vacant by the detachment of Surgeon Lockwood, and applied thus early because if he was to get the position, he designed to take a course of lectures (on chemistry) to better fit himself for it, and adds:

> I have never asked for a situation I was not competent to fulfill; I have not shrunk from the most unpleasant, and have never urged private feelings when they could have interfered with public duty. Now when both can harmonize, I plead them. Annapolis is a location suited to the peculiar exigencies of my immediate family. It is my native place, and the residence of my aged mother, whose feeble state of health would be much comforted by my close vicinity to her.

Although no favorable reply to this appeal seems to have been received, nevertheless the doctor went ahead and took the course in chemistry. His chemical notebooks are still in existence, but unfortunately they do not reveal where he studied. Presumably it was at the University of Maryland, for an official letter of this period has been found which is addressed to Baltimore.[17] This letter, dated April 5, 1849, is evidently in answer to one the doctor had written repeating his request to be assigned to the Naval Academy. It bears an endorsement by the Chief of the Bureau of Medicine and Surgery, Thomas Harris, reading as follows:

> I have the honor to reply that the situation of surgeon of the navy school is one which combines the talents of a surgeon and those of a lecturer on chemistry. Dr. Pinkney is, I believe, a good surgeon, but as a lecturer he has had no experience whatever. Dr. Bache[18] who is now surgeon of the fleet on the Brazil station is fully competent to discharge its important duties, and expects to return shortly.

It is of interest to note that in this very year (1849) when Dr. Pinkney's ability as a lecturer was thus called in question, cholera was prevalent in several centers in the United States, and the doctor having prepared a lecture on the subject, giving a graphic history of its rise in India and its importation into Europe and America, delivered the lecture by request in several cities. His presentation was considered most opportune by the public, and by the profession.

But as for the duty at Annapolis Dr. Pinkney was doomed to disappointment, although as will be seen later, orders to the much-coveted place did eventually issue, same four years later.

On April 14, 1849, he addressed this letter to the Hon. Wm. Ballard Preston, Secretary of the Navy:

> It is very certain that the services rendered by the Navy in the Gulf are not, and never have been, duly appreciated by the Public Mind, and that for the obvious reason, that no specific statement of facts relating to it have met the public eye. I have therefore taken the liberty to enclose a brief view of what was done by the "Naval Battery" at Vera Cruz, thinking it probable you would not otherwise see it. The certainty I feel that you are deeply interested in whatever concerns the body over which you are called to preside, must form my apology for this intrusion on your time and patience.

The doctor's account of the Navy's participation in the Mexican War seems to have been lost. It is not among his own papers and cannot be found in the official files of the Navy Department.

In March, 1850, he received the signal honor of being accorded the thanks of the General Assembly of his native state, in which his name was associated with that of Commander Franklin Buchanan, "for gallant and meritorious conduct in the late Mexican War."

On February 9, 1850, while at Annapolis, he received orders to the Steam Frigate *Saranac*, and on the twenty-fifth reported to Captain Wyman. On the journey to Portsmouth, N. H., where he was to join the ship, he was accompanied by his brother, the Rev. William Pinkney, who remained with him until the ship sailed. In their progress to Portsmouth they proceeded leisurely and saw much of interest particularly in New York and Boston. This was the clergyman's first visit to New England, and he has left a journal in which he noted the chief incidents of their travels. The journal is too long for reproduction here, but the following extracts from it are of interest:

> Feb. 21, 1850. Left Baltimore on the night train for Philadelphia, a very tedious, yet in some respects amusing trip. Between those who were trying to get to sleep and those who wholly despaired of such a luxury, I was not a little diverted . . . There is a dull monotony about railroad travel, peculiar to itself. The very beauty of the scenery mocks the eye, for it is seen only to disappear, before you can form an image of it in the brain. Besides, when protracted, it is intolerably tedious . . . walked out and looked once more upon the noble steeple of old Trinity. It is a truly grand and stupendous edifice . . . Took a walk in the bright mellow moonlight and looked upon Grace Church with its jewel of a parsonage . . . Broadway the paragon of streets stretching out from the harbor for miles . . . Thousands were in motion—crowds upon crowds. (But one thing shocked the eye, and that was the bold unblushing exhibition of profligacy.) The next morning we started for Boston . . . At Boston we stopped at the Revere, a hotel without any approach at rivalship in any portion of the Union . . . We reached Portsmouth after about two hours . . . I called upon Dr. Burroughs with Dr. Chase. He is a fine noble specimen of an old school Christian gentleman, a pattern of hospitality and refinement . . .
>
> Dr. B. called to see us at the Rockingham and took us to the Atheneum, where a very valuable library consisting of choice volumes in every department of science and literature, has been collected . . . From the top of the building we had a magnificent view of Portsmouth and the surrounding country. The city is almost an island. The sea in one direc-

tion, the high lands, and far beyond them, the White Mountains, skirting it in the distance. The Navy Yard on the island opposite—the *Saranac* floating in majestic beauty in the dock—Judge Woodbury's house in view. The Pisquatequa flowing with its deep and rapid current. The Episcopal Church on a commanding hill, looking down upon the town, as it should, the ark of hope . . .

We took a seat in the Boston cars . . . and were snugly seated . . . in the Revere by 10 o'clock . . . This is one of the most delightful railroads in the Union. Beautiful scenery and rural architectural skill and taste are strewed broadcast through the country . . . We started out in a rockaway of the latest Boston fashion for the Navy Yard. Went aboard the Franklin . . . had a fine view of the shipping . . .

We then stopped at the residence of the Rev. John Woart . . . called upon Dr. Gambril . . . a surgeon of the navy and an Annapolitan . . . who promptly tendered his services to show us several things of interest in Boston. He took us down Mt. Vernon Street where are some of the most magnificent residences six stories high, bow fronts and large plats before them—an entire square altogether uniform . . . We got a back view of the State House . . . There is a few feet from this jet [fountain] an iron-bound tree, the monument of some ancient glory, and the effort of man to stay the ravages of time, by girding round its brawny arms, that have frowned defiance upon the tempests of 100 winters, with iron braces, is very touching, and speaks volumes for the heart that beats in Boston. I gazed some minutes upon this touching spectacle and thought of the cruel fate and hard destiny of the noble old poplar at Annapolis. Ours is a monarch of the forest and not less renowned in the legends of thrilling story . . . [Then follow descriptions of visits to Faneuil Hall, the Custom House, the State House, Mount Auburn, Harvard University and the Library.]

At Harvard the doctor and his brother looked at the cabinet of minerals collected and arranged by the notorious Professor Webster who murdered Dr. Parkman. Ninian little thought, as he gazed on the handicraft of Professor Webster that some years later when at Fayal in the Azores he should sit next to a charming woman at a dinner, who proved to be the daughter of this unfortunate man.

We saw on our way to the cemetery as on our return the very tree where Washington first unsheathed his sword in defence of his country's liberty. It is a noble American elm . . . Was it mere accident that in the multiplicity of trees that offered to the illustrious patriot soldier a sheltering shade, he should have selected the proud American elm, as the one for the first unsheathing of his sword, or was it not rather the type and pledge of his country's emancipation from the thraldom of foreign misrule? . . .

The *Saranac* sailed from Portsmouth early in March, 1851, and arrived at Havana, Cuba, on the nineteenth of that month. From Havana Dr. Pinkney wrote home about his experiences, particularly of his meeting with Henry Clay, which formed a pleasant and interesting event of the cruise:

We arrived here on the 19th inst. from Port-au-Prince and had the infinite gratification to receive letters . . . I dined there [at Dr. Mercer's] a few days ago and was so fortunate as to be seated close enough to Mr. Clay as to hear him converse. This was a great treat indeed and one I enjoyed much. It made me feel proud of the great attention and respect paid the great and aged statesman. His mind is as fresh and vigorous as ever; there is not the slightest indication of decay in this respect, yet I do perceive that the physical energies are gradually giving way, but I trust he may be spared some years longer. I hope the Whig party will nominate him as candidate for the next Presidential campaign: he richly deserves this from the zeal and patriotic course he adopted in the settlement of that great question which threatened disunion. At this moment he is undoubtedly the most popular man in the U. S. and the Whig party can never heap upon him too many honors. I see by the papers that Scott is talked of. I hope not, for I am opposed to military men for the presidency. Well, to return to the dinner. When fruit came on those who sat between Mr. Clay and myself left the table and I was invited by Mr. Clay to take a seat beside him. I accepted of course and had a most delightful conversation for half an hour. Since I have had another interview with Mr. Clay.

The following letter from Mr. Clay to Dr. Pinkney, written after their meeting, indicates the nature of the subjects discussed by them:

Havana, 29 Mar. 1851.

My dear Sir,

I request your acceptance of my thanks for the Chart and History of Hayti, which you have done me the favor to present to me . . . I beg your acceptance also of my acknowledgements for your friendly consideration of me, and for your kind estimate, quite too high & flattering, of my public services. On the recent perilous occasion, in our Councils, it was matter of great gratification and encouragement to have been perfectly assured that the Navy as well as the Army, and the great mass of the people of the U. States, were true and faithful to that Union, which is at once the bond, the security, and the glory of all. Had William Pinkney been alive, your illustrious relative, his eloquent voice would have been conspicuously and effectively heard in the defense and support of that Union. With all best wishes for your health, happiness, and prosperity, I am, respectfully,

Your obedient servant,
H. Clay

Dr. Ninian Pinkney,
On board the Saranac,
Port of Havana.

In July, 1851, when the ship reached Philadelphia, Dr. Pinkney received information of his wife's serious illness, and from now on for several months he appears to have been granted frequent leaves of absence, probably on account her wretched state of health.

In January, 1852, Dr. Pinkney wrote to the Secretary of the Navy, presenting his views on a question which became the object of his untiring interest for the balance of his official life, namely, appropriate rank for the staff officer, toward the attainment of which his efforts materially contributed:

Washington, Jan. 19, 1852.

Sir: I would most respectfully and with becoming difference [*sic*], as one deeply interested in the question of the relative rank to be assigned by Act of Congress, solicit the appointment of a Board of Surgeons and Pursers to draft a report which can be submitted to the consideration of that Honored Body.

In the Board that was convened in obedience to an order of the President of the United States, those two departments of the service were not represented, and consequently but one side of this important and much vexed question has had a hearing, and enjoyed an opportunity of making known their views of the rights, which they deem justly theirs. In making this request I do not ask the official sanction of the report, but only seek an opportunity to be heard by Congress.

I am, Sir, &c
Ninian Pinkney

The Hon. Wm. A. Graham,
Secretary of the Navy.

[Endorsed] (refer Dr. P, to letter of Jan. 23, '51, to Bur. M. & S.)

It will be well to repeat here what his brother, the late Bishop, had to say about his devotion to this subject:

> Surgeon Pinkney was deeply attached to the Navy. To his own corps his attachment was well nigh romantic. He fought almost single handed for the rank to which he felt it was entitled, and he bore his eloquent protest against the wrong until it was redressed. No opposition dismayed him. And yet in his manly and fearless assertion of the rights of his corps he was never unmindful of what was due to the officers of the line. They were men to be proud of, and most fully did he recognize their claim to the country's gratitude and highest praise.

On April 7, 1852, Dr. Pinkney received the much-coveted orders to the Naval Academy, and shortly afterwards reported to Commodore Stribling, the Superintendent of that institution.

Of this period of duty we find few reflections in existing records. From about this date he manifested a great interest in the American Medical Association, and beginning with the year 1852, when he went to the meeting at Richmond, Virginia, he made it a practice to attend its annual meetings, often as an official delegate. At the Richmond meeting he read a memorial prepared by him to accompany a draft of a bill which was about to be presented to Congress to secure rank for the medical staff of the Navy. His able presentation of this measure secured for it the approbation of the Association, the approval of his own Chief of Bureau, and the passage of a resolution by the Association recommending it to the favorable consideration of Congress.[19] In this connection the memoir states:

> He took a very lively interest in the American Medical Association, and never lost an opportunity of mingling in its deliberations. At St. Louis, Cincinnati, Chicago, Philadelphia, New York and San Francisco, he was in his place . . . Twice was he honored with a call to go abroad to represent the Association in the Old World—the second time as chairman of the delegation. He redeemed his mission, for his report was of general interest, and fully sustained his great reputation. He was one of its first founders, afterwards a Vice-President, [in 1876] and continued to be its most enthusiastic and ardent supporter. He felt that the medical profession had not occupied the position to which it was entitled—that it was not so prominent in the councils of the country as it should be. Educated to the highest point of culture, and not subjected to the demoralization that is so apt to creep into those who make politics a business, he was persuaded that it was peculiarly fitted to sway the destiny of the country, and take the lead in law making and its wise administration. He therefore hailed with peculiar pride and pleasure the [American] Medical Association as a power in the land. Many there are to-day who can attest the fidelity and efficiency of the work he performed in giving it fullest and completest success.

The appreciation accorded his efforts in connection with the meetings of the Association, by Dr. Thomas Harris, his own Chief of Bureau, appears in a letter which the latter wrote to Dr. William Maxwell Wood, a fellow delegate to these meetings:

> Navy Department, Bureau of
> Medicine and Surgery,
> May 9th, 1848.
>
> . . . Your views with regard to the past and prospective usefulness of these meetings, and the advantages to be

derived from a participation in their proceedings by the Medical Officers of the Navy, have been read with pleasure, and are in unison with my own.

The profession at large have but few means of acquiring interest in, and respect for, this portion of their fraternity, isolated by the sphere of its duties, and yet so favored in many respects, by the possession of rare and varied experience.

The results of your efforts, and those of Surgeon Pinkney, when considered in reference to the brief notice afforded you, deserve the highest compliment. I shall endeavour to anticipate the Convention of 1849 by an early selection of delegates; who, in addition to the advantages of preparation, may equal their predecessors in professional zeal, and esprit de corps.

In the spring of 1853, the doctor's brother, the Rev. William Pinkney, completed a life of their distinguished uncle, William Pinkney. As this work had involved much labor and research, the writer felt the need of change and recreation, and in the summer he joined Dr. Pinkney and his niece Amelia in a trip to Buffalo, Albany, Niagara Falls, the Hudson and the St. Lawrence rivers. At Albany they met the Rev. W. B. Sprague, whose interest in favor of the "Life of William Pinkney," the doctor evidently sought on behalf of his brother, as will appear in the letter here shown:

Albany, Oct. 15, 1853.

My dear Sir:

Your brother at least would not need to be informed that I should consider it a privilege to serve him by any means in my power; but I am quite sure that any attempts of mine to introduce to the public such a work as his—I mean in any way that should connect my name with the book, would be anything else than auxiliary to its success. I never saw the illustrious man whom it is designed to commemorate; and though I have always had a high admiration of his talents and accomplishments, my impressions concerning him are rather general than particular; and in addition to this, the fact of my being of a different profession would seem to disqualify me, in some measure, for appearing over my own name as his eulogist. I anticipate great pleasure in reading it, as well on account of my great respect for the writer as my veneration for the distinguished subject. I am, my dear Sir, with great respect,

Faithfully yours,
W. B. Sprague.

N. Pinkney, Esq.

Dr. Pinkney's rare gifts as a public speaker, to which his brother frequently referred in glowing terms, brought him forward on many notable occasions as the orator of the day. In 1854, by request of the Maryland Legislature, he delivered an address before that body on "The Home and Foreign Policy of the Government of the United States." In the same year he delivered the Commencement oration at St. John's College, and in the following year he was selected by the Hon. John Kennedy, Secretary of the Navy, to make the principal address at the Naval Academy on the occasion of the presentation of the flag which Commodore Perry had raised in Japan. A contemporary account of this latter event states:

Upon the conclusion of this part of the ceremony [the presentation of certificates of graduation to the acting midshipmen].[20] Surgeon Pinkney presented to the Academy the first American flag unfolded upon the soil of Japan, under the command of Commodore M. C. Perry, premising it with the following just and appropriate remarks:

"I hold in my hand the flag of my country, which I have been deputed to deliver to the Naval Academy, through its gallant and accomplished Superintendent [L. M. Goldsborough] in the name of Commodore Perry, with the sanction of the distinguished Secretary of the Navy. It is the flag of the Union, the symbol of our past glorious history, and the pledge of its future distinction. A symbol of the distinguished heroism of our fathers, when we, as a nation were in comparative weakness. The thirteen stars that twinkled upon its azure folds then truly numbered our State sovereignties. Now they are so multiplied that we have swollen the original galaxy. As the flag of our country it always waves here, and here it will continue to wave as long as the present enlightened policy of our rulers shall mark the destinies of the nation, and the pulse of liberty shall continue to beat in the great American heart. This is the first American flag unfolded upon the soil of Japan; unfolded in peace by one of our distinguished officers. It is the first link which connects us with a great nation which has hitherto declined all intercourse with its fellow nations of the earth and secures to us the rich advantages of a friendly intercourse . . .

Perry . . . his was a name full of reminiscence of past deeds of glory. A name enrolled upon the highest page of Naval history. A name which will live as long as Erie rolls a wave upon its bosom or echo lives to waft along its shore the thrilling thoughts of the past.

Who among us but feels the flush of patriotism and naval pride mantling his cheeks at the mention of such a name? It is enough to say that our gallant Commodore has not dimmed its lustre. He has made it memorable in the sharp conflict of battle, and although denied the privilege of battling on his own appropriated element, he sought the enemy in his cannon-girt entrenchment at Vera Cruz and demonstrated the invincibility of American arms and the prowess of seamens' valor . . .

Having unfurled the banner of his country upon the soil of Japan on the 14th of July, 1853, he now lays it down at your feet, that you may unfold it to the gaze of American youth, who will one day be called to uphold its honor and preserve its lustre untarnished . . ."

To this address Commodore Goldsborough responded in becoming terms, accepting the flag, and giving assurance that it should be preserved with care in the archives of the Academy.

In June, 1855, Dr. Pinkney made official application to be ordered to the frigate *Constellation*. This was endorsed by the Superintendent of the Academy, as follows:

> In justice to Dr. Pinkney I beg leave to say I have been particularly impressed with his professional ability and kind and assiduous attention to the sick ever since I have been in command at this place; and I trust it may be consistent with arrangements in relation to the *Constellation* to grant the Doctor's application and serve on board of her.
>
> L. M. Goldsborough, Superintendent.

In seeking the place on the *Constellation* he invoked the aid of many friends, including Commodore Perry, who wrote him this letter:

> Washington, June 24th, 1855.
>
> My dear Doctor:
>
> I found after my arrival at this place your kind letter of the 15th . . .
>
> It is hardly necessary to thank you for the very flattering sentiments expressed by you with reference to my public services in your beautiful address which I have seen in the *Baltimore Sun*[21] . . .
>
> I saw Capt. Goldsborough yesterday who spoke in high favor of the appropriateness of the ceremony and of the eloquence of your remarks on the occasion of the presentation of the flag.
>
> Why has he not written out and published his reply? These little incidents are calculated to exercise a salutary influence upon the minds of the young

officers, and should be recorded as forming part of the history of the institution.

On perusal of your letter I immediately called upon Dr. Whelan [Surgeon-General of the Navy] and mentioned to him, (at the same time speaking of your valuable services in the Gulf), your wish to be ordered to the Constellation, and if this was impracticable, your desire to remain at the School until the Fall. He replied that he had no intimation of the contemplated equipment of the Constellation, and that it was arranged that you were not to be detached from the school for the present.

I shall be some time in Washington and will be on the lookout to give you notice of any ascertained contemplated changes.

Most truly yours,
M. C. Perry.

What was beneath the surface of the evident desire to be relieved from duty at the Academy at this time cannot now be determined, but there is little doubt that his anxiety to go had some background. This view of the situation is supported by certain correspondence. At the end of June the doctor addressed a rather curt letter of request for detachment to the Secretary of the Navy, the Hon. J. C. Dobbin: "I have the honor to request to be detached from this Institution."

This was endorsed by Commodore Goldsborough in the following manner:

> I have nothing to urge why this application should not be granted provided another medical officer be at once ordered to take Dr. Pinkney's place . . . If another medical officer is to be sent here I beg leave to express the hope that in consideration of the place he is to occupy and the moral influence he will be called on to exercise among students particularly, as well as among the younger officers of the Institution, the Department will first assure itself as to his correctness of habit in every particular.

It was to the *Susquehanna* and not to the *Constellation* that the doctor was ordered in the Spring of 1856. Several noteworthy experiences marked this cruise, but especially he gathered a further knowledge of the littoral of the Mediterranean, and increase of acquaintances in England.

The *Susquehanna*, after leaving the Mediterranean, joined the Steam Frigate *Niagara* and several British vessels off the coast of Ireland in the first attempt to lay an Atlantic cable.[22] For six months previous to the cable-laying the ship was at Gravesend, and the doctor was enabled to spend much time in London, where he renewed his connections with Sir William Fergusson and with the other friends whom he had met in that city in the Spring of 1840.

Dr. Pinkney's letters to wife and daughter during this cruise contain most complete descriptions of places visited, and his letters from Italy are particularly noteworthy for their length, and wealth of detail. Some of them run to 35 pages quarto of fine writing, constituting veritable guide books of the regions and places seen by him!

The doctor's first letter of the cruise was started at sea on the passage to Fayal, and finished at that port. While at Fayal he attended a dinner given by the United States Consul, Mr. Dabney. Speaking of this dinner he says:

> I singled out a lovely young lady and found her charmingly agreeable. Of course I endeavored to make myself agreeable . . . The lady whom I have waited on I have since learned is a daughter of the Webster who was hung.

One of Mr. Dabney's sons is married to her.[23] He was engaged to her before Webster had committed the murder, and when he was tried and condemned to death, she insisted upon the engagement being broken. To this Mr. Dabney objected, much to his credit, and they were married and are now living with his father on the Island.[24]

On the seventeenth of July, 1856, the ship sailed away from Fayal for Gibraltar with Spezzia, Italy, as the port of destination. From Gibraltar on July 31, he wrote to Mrs. Pinkney:

> . . . The sight of a letter from you would gladden my heart and make time pass more pleasantly and swiftly. I sometimes get almost homesick and it requires all my firmness to struggle against it. I find that as one becomes more advanced in years separation is more difficult to endure. I miss greatly the many little comforts at home, which I did not, when in the enjoyment of them, sufficiently appreciate . . . To be the Chief of the Bureau of Medicine and Surgery is the least I could accept and less than this the party, if successful, could not offer. I have therefore public and private reasons which induce me to desire the success of Mr. Fillmore. The country would be greatly benefited by it. If he is elected, and certainly there are strong reasons to believe that he will be, and my wishes are gratified, it would be in my power after a few years to retire from the navy in a manner agreeable to my feelings. I am every way delightfully situated, but I do long to be able to cut adrift from the Navy.

The ship was at Palermo, Sicily, on the first of September, and he then writes:

> . . . On the morning of the fifth of August we received orders from the Comre. to join him at Malaga . . . Late in the evening while we were preparing to get underway we were honored by a visit of Princes of blood. The brother to King William of Prussia, and Admiral in the Prussian Navy, and Prince William of Hesse, cousin to Queen Victoria, came alongside in their barge. They remained until after sundown, consequently they were not saluted when they left, it being contrary to the usage of the naval service to salute after that hour. We were much pleased with them. The Admiral is a stout jolly looking person of easy and pleasant manners. Having visited all parts of the ship, they came into the wardroom and partook of some refreshments which we had prepared on the spur of the moment. They seated themselves and seemed gratified with this mark of attention. The conversation turned upon naval officers and we were all surprised to find the Admiral so well posted in reference to our Navy. The Prince is a young man and remarkably handsome. He possesses manners markedly prepossessing, and is free and easy in conversation. The Admiral being a Prince Royal was saluted by the Garrison with a national salute of 31 guns. His salute as High Admiral is 15 guns. So soon as they left we got underway . . . to reach Malaga, only 60 miles away . . . found the *Congress* on arrival. The *Constellation* had sailed on a cruise.

Soon after arrival in Spanish waters there came a visit to the Alhambra from Granada, and then one to Palma (Spain). His observations in these places gave him materials for several long letters home. Towards the end of one of these letters this statement occurs: "If Fillmore is defeated my prospects are gloomy indeed. Every effort will be made to defeat him . . . if Fillmore is elected my prospects will be cheerful." Alas, for the vanity of human wishes! In the election Fillmore carried but one state. True, that state was Maryland, Dr. Pinkney's native state, but the general Whig success spelt the doom of his hopes of preferment, and, as we shall see shortly, he fared but ill under the administration of James Buchanan.

His letters describe trips to Pompeii and to Herculaneum and then the ship sailed for Toulon. From the latter port, in November, they left for Gravesend, England.

During some months of the cruise in the Mediterranean in 1856–1857. Dr. Pinkney acted as caterer of the wardroom mess. This was a duty which he performed with zest, for he was a *bon vivant* and an acknowledged connoisseur of wines. Judging from a menu which he reproduces in a letter written in January, 1857, he must have been a most popular caterer:

> Mr. and Mrs. Semple took passage [from Genoa to Naples] as guests of Capt. Sands . . . They took dinner with us in the W.R. and it was a very pleasant dinner party . . . nicely served up and in courses. Excellent soup, roast turkey, ham, peas and cauliflower; boiled leg of mutton and wild duck with jelly; plum pudding, mince pies, and boiled custard; fruits, oranges, apples, dried figs and nuts. You will doubtless think that this is pretty good living for persons at sea."

The extracts from letters which appear below reflect his experiences in England:

> Gravesend, June 18, '57.
>
> My dearest Mary:
>
> On the morning of the 6th I paid a visit to London and spent two days most delightfully . . . The Queen had just arrived from Osborne House on her way to St. James's Palace where she was expected to give her first drawing-room reception. Piccadilly was lined with the gorgeous equipage of the nobility and the crowd was immense. I repaired to St. James's Square through which the Royal Family were expected to pass on their way to Buckingham Palace after the drawing-room reception was over.
>
> I had a good view of the Queen as she passed. The equipage was really superb and drawn by four cream-colored horses. She was alone and draped in mourning. She wore a train of black silk trimmed with black crape, and bouquets of black flowers. She wore a head dress of black jet with black feathers. Prince Albert, the Princess Royal, and others of the Royal family followed in equally splendid establishments. The sight was truly a pleasing one.
>
> On the 10th I dined in company with Capt. Sands and several of our officers at the London Tavern. It was a public dinner in honor of the anniversary of the Metropolitan Free Hospital and we were invited guests. Lord John Russell (ex-premier) presided. He is a man of my size and has a pleasant expression of countenance. The dinner was handsomely gotten up. Upon being ushered into the reception room we were greeted with applause. A guard of honor each holding a staff in his hand, surrounded Lord John Russell.
>
> At ¼ past six p.m. the dining saloon was thrown open and the guests seated. There were three long tables extending throughout the greater part of the room. At one end a table was placed cross-wise. At this table Lord John Russell and those of the nobility who were present were seated. The Princes of Oud [Oude] were present as guests. One of them is a large fat man; the other rather good looking. They were richly dressed and wore massive gold crowns set off with jewels. Their complexion is a little lighter than Liz [probably one of the Pinkney's negro servants]. They ate nothing but a little fruit, it being contrary to the custom of their country to partake of meat, unless slaughtered by one of their own people.
>
> One of the galleries was filled with

ladies; the other was occupied by a band of music. Soup was first handed around. The meats were then placed on the table, but handed round in courses. The dessert was placed on before the meats were removed. Numerous toasts were proposed by the chair. Before however any toast was proposed several beautiful songs were sung by a Mr. and Mrs. Brougham, the band occasionally playing a national air. A large man stood behind the chair of Lord John Russell, who acted as master of ceremonies. After we were all seated he addressed the party as follows: "I pray you silence, my noble Lords and Gentlemen, for grace being offered." This being done we took our seats and discussed in a very creditable manner the delicious spread before us. So soon as the dessert was over, two silver salvers were placed before the Princes of Oud and Lord John Russell. Having dipped their napkins into the water, the salvers were pushed around to the various members. Several bottles of champagne were now placed behind the chair of the Presiding officer. The *big man* cried out in a stentorial voice, "I pray silence that the Right Hon. Lord John Russel may be heard." The toast was then given in honor of the Queen, when all were addressed as follows: "I pray you charge your glasses, nobles and gentry," this done, "Three cheers, upstanding." It was a strange ceremony and a most amusing one, and, as many toasts were drunk, it proved a very fatiguing one. No one was pressed to take wine, a good custom. So soon as dinner was concluded, we adjourned to another room where we were joined by the ladies to take tea. Here we remained till 10 at night. From here we were invited to attend a fete given by an ex-member of Parliament, the Hon. William Gibson. We accepted the invitation.

His establishment is in Buckingham Square. When we arrived an immense crowd had assembled. The house, though capacious, was completely filled. The staircase was lined with ladies and gentlemen and the rooms also. The society was composed of the nobility and distinguished commoners. The ladies were elegantly dressed, but not remarkable for beauty. Ice cream and cake were served up in one of the upper rooms, and meats, jellies, &c in one of the basement rooms. The ladies were taken first to the ice cream room and then to the meat room, so that the entertainment, although it commenced at 11, it continued until 2. All the ladies were not entertained at once, but in succession. I enjoyed myself a great deal . . .

On the morning of the 21st, in company with several of our officers, I started at an early hour to hear the celebrated Mr. Spurgeon. The service commences at ¼ before 11, but the crowd is generally so great that it is absolutely necessary to be on the spot several hours before the time. Upon our arrival we found an immense gathering arranged in line half a mile in extent. We took our station in the rear. The greatest system is preserved by the Police, and no pushing is permitted. At 10 the gates were opened. The building in which he preaches is located in the Surrey Gardens. It is a public building and not a church. No church would accommodate the crowds that swarm to hear him. Price of entrance, one shilling, and reserved seats, half a crown. Ten minutes after we entered every seat was occupied. The building is elliptical in form of immense size. It has three galleries which traverse the interior. At ½ past ten the doors were thrown open to the public, and in a short time the entire building was filled. It is said that there were ten thousand persons present, and the assemblage was composed of the nobility, gentry, and common people. It was a splendid audience. At the appointed hour Spurgeon appeared. He is a young man not over twenty-three years of age. Stout in person, but not tall. Has an intellectual face and is good looking. He selected as his text, "God is slow to wrath and great in power and will not acquit the wicked:" [Nahum 1, 3.]

> He commenced in a clear and distinct voice. His language was at time eloquent, but I did not think he treated the subject in a masterly manner. No finer subject could have been selected for a display of powers. There was very little originality in the ideas, and occasionally there was a coarseness of style. At times he was given to ranting, and his voice when too much raised, became inarticulate. The most profound attention was paid him throughout the discourse. He speaks boldly and does not mince his words, and herein I think are his powers. My curiosity was much excited to know what character of speeches it was that could bring together the first men of England and continue to do so. The style of debate in Parliament is more like ordinary conversation, the tone of the voice but seldom raised. They profess to despise oratorical display; they do so because they are deficient in this power. I am satisfied of this. If not why should Spurgeon (a declaimer) attract the very men who profess to despise display. Spurgeon would not have, in my humble opinion, compared favorably with [Thomas H.] Stockton, [Henry B.] Bascom, or [George G.] Cookman.[25]
>
> He spoke for nearly an hour and at times I thought he attempted to imitate the style of speaking as adopted on the stage. He preaches on Thursdays and Sundays and always attracts crowded audiences. He talks a great deal of brimstone and makes one really feel as though he were in a sulphur bath. I do not like this kind of preaching; it is not chaste and refined and is productive of but little good. That he is trying to do good I have no doubt, and it is believed that his efforts are not thrown away. This kind of public preaching is becoming very popular in this country and the fullest scope is allowed.

Similarly he gives a graphic description of a military review in London, at which Victoria Crosses were distributed by the Queen:[26]

> Through the influence of a prominent citizen in London we obtained tickets of admission to the gallery constructed on the review ground in Hyde Park, where the distribution of Victoria Crosses was to take place on the morning of the 26th. We arrived in the Park at the early hour of 7, and yet a vast concourse had assembled to witness this interesting and imposing ceremony. The morning was delightful and everything conspired to make the scene an agreeable one. The gallery was capable of accommodating seven thousand persons. The center was occupied by the court and some of the Royal visitors, while the wings were given to the foreign ambassadors, the members of the legislature and other privileged persons. Our party occupied excellent seats at a very little distance from the center. The actual proceedings of the morning commenced about nine o'clock, when the infantry was formed, and immediately afterwards the cavalry and artillery . . . The officers and men who were to receive the Victoria Cross were formed in position near the center of the pavillion. The Queen entered the Park at ten o'clock. A royal salute from the batteries at the end of the line announced her arrival. She was accompanied by Prince Albert, the Prince of Wales, the Princess Royal, and other members of the Royal family, Prince Frederick William of Prussia, the Duke and Duchess of Cambridge, and the Princess Mary of Cambridge. The Queen rode a fine charger, and wore a red jacket and a small round hat with red and white feathers. She looked well and was enthusiastically cheered. Prince Albert was dressed in a Field Marshall's uniform. The Prince of Wales and Prince Alfred were attired in Highland costume and rode on ponies. The other members of the Royal family arrived in open carriages, and were afterwards conducted to the Royal pavillion in the center. Immediately upon her arrival the Queen rode round the lines, the bands playing as she passed. The distribution of the

Victoria Cross was to those of the troops whose career during the struggle in the Crimea was characterized by more than ordinary courage, and many of whose daring and intrepid acts were never surpassed in the history of any war. Everything combined to make the spectacle most effective. So soon as the Queen had taken her position, the recipients passed, one at a time, each presenting his card to the Adjutant-General, who stated their names to the Queen as they approached. The men who were to receive the cross as they stood in line presented a very strange appearance, for some of them having left the service, were not attired in regimentals. One of them was dressed as a private gentleman, another as a policeman, and there was a third in the dress of a park keeper. The presentation occupied but a few moments. After receiving the cross each man retired to his original position, the bands playing the whole time. The distribution being concluded the troops marched past the Queen in open columns . . . the bands playing magnificently . . .

The regiments were accompanied by their pet animals. The Highlanders were followed by a splendid Newfoundland dog; but the Crimean ram who marched in company with the rifles, keeping capital time, attracted great attention. . . . The whole affair was truly grand. Lord Cardigan was present in command of the cavalry and mounted on his Balaklava charger. You no doubt recollect that it was this officer who led the celebrated charge of cavalry during the Crimean War. Sir William Williams, [Sir Fenwick Fenwick-Williams] who distinguished himself at Cars [Kars] (in the Crimea) commanded the artillery . . .

We left Gravesend last evening and arrived off Cowes this morning (28th). From here we will go to Cork preparatory to starting on our final trip to lay the cable.

Following the unsuccessful attempt at cable laying, the *Susquehanna* returned to the Mediterranean, and was at Genoa in October, 1857, preparing to sail for Key West, Florida by way of Madeira. In one of his last letters written to Mrs. Pinkney before sailing, the doctor again alludes to the pending Presidential election (the Fillmore-Fremont-Buchanan contest):

> I wish I were at home to do battle in the cause our leaders must make . . . If I had ample money I should be now where I have always desired to be. But poverty outdistances ambition and I must submit.

In April, 1858, Dr. Pinkney was detached from duty on the *Susquehanna*, proceeded home on leave, and in December was ordered to duty at the Naval Hospital at Portsmouth, Virginia.

Towards the close of this year he was called to his last meeting with his revered mother. Her final illness was of short duration. She died in her home at Annapolis on the fourth of November, having reached the venerable age of eighty years. Mrs. Pinkney kept up, even to the end of her life, a frequent and regular correspondence with her two sons, Ninian and William. "She was a charming letter-writer, unconsciously touching everything that she wrote with the sweetness, the beauty, the tenderness, and the love that filled to overflowing her own cultured mind and chastened heart."[27]

With the death of the mother, the daughter Amelia was left alone in the Pinkney cottage, and remained there until the Spring of 1859, Subsequently she divided her time between the two brothers, living with them alternately, but she survived both and her last days were spent in Annapolis. She died on April 8, 1918.

Dr. Pinkney was destined not to remain long undisturbed at the Portsmouth hospital. In June, 1859, he received orders to the *San Jacinto*, a vessel fitting out at Brooklyn, New York, for service on the West Coast of Africa. The summary manner in which he was ordered away after a rather short period of shore duty aroused his ire as well as the resentment of his many friends, who assembled in mass meeting and passed resolutions of protest against the action of the Navy Department, which they described as "an act of tyrannical persecution worthy of the palmiest days of the English Star Chamber or the French Bastille." The resolutions continued in this strain:

> Dr. Pinkney has but recently returned from a long and arduous service at sea . . . He came back to his native land a victim of the yellow fever, which disease he had contracted in the heroic performance of his duties in attending upon the sick on board the *Susquehanna* . . . He has dared to think for himself in this republican country, and has had the hardihood even to make a speech in opposition to the corruptions and depravity of the Buchanan dynasty. He has by his active interference contributed to the production of a great political revolution in Portsmouth, Va. . . . Dr. Pinkney has dared to speak out as an American freeman . . . and because he choose to differ in opinion from the administration of King James I [President James Buchanan], his sojourn on shore has been summarily abbreviated, and he has been ordered to the most unwholesome station to which our naval ships are wont to repair . . .

Nevertheless, in spite of all protests, the orders remained in force and the doctor had to go as senior surgeon in the *San Jacinto* to the African coast. By April, 1860, however, he was back in Easton with his family, having been invalided home from the African station by a medical survey held at the instance of the assistant surgeon, David Kindleberger.

In October, 1858, while still on leave he was invited by the Lawrence Literary Society of Annapolis to deliver a lecture. This was read at the Naval Chapel on October 30th and was entitled, "The Life and Character of Collingwood." Admiral Collingwood was one of Dr. Pinkney's heroes. His friend, Captain Henry Eagle, in acknowledging the receipt of a copy of the lecture, wrote: "you have not said too much in favor of the character of Collingwood; he was in many respects superior to Nelson."[28]

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1. BENSON, A. C. Essays. The late Master of Trinity (W. H. Thompson). N. Y., 1896, p. 239.
2. "Travels through the South of France and in the Interior of the Provinces of Provence and Languedoc in the years 1807 and 1808, by a route never before performed, being along the banks of the Loire, Isère, and the Garonne, through the greater part of their course." Made by permission of the French Government. By Ninian Pinkney, Lieutenant-Colonel of the North American Native Rangers. Ed. 2 Lond., 814, pp. viii, 473; 21½ cm.; (folding map). [Ed. 1, Lond., 1809.]
3. Notably Edward Coote Pinkney (1802–1828), son of William Pinkney, hence a cousin of Ninian Pinkney, M.D. *See* Mabbott, T. O., and Pleadwell, F. L. *The Life and Works of Edward Coote Pinkney* N. Y., Macmillan & Co., 1926.

4. In September, 1926, the Harwood house was purchased by St. John's College, and will be maintained intact by the college as a museum.

5. "That vivacious and pugnacious Scot," as Sir William Osler characterizes Pattison. See Cushing, H. *The Life of Sir William Osler*, Cambridge, Harvard Univ. Press, 1925, i; 581.

6. All efforts to trace this library or its contents have proved unsuccessful.

7. The Navel Lyceum was organized at the New York Navy Yard, November 28, 1833, by the officers of the Navy and Marine Corps stationed at the yard or living in its vicinity. Master-Commandant M. C. Perry presided at the first meeting, and Commodore Chas. G. Ridgely, then commandant of the yard, was the first president.

8. The Nervous System of the Human Body; embracing a Dissertation delivered to the Medical Profession of Philadelphia, and students of the two universities, on the subject of the nerves, brain, and organs of sense, 8 vo., 32 pp., Phila. Printed by W. F. Geddes, 1839.

9. Benjamin Chew Howard (1791–1872), who was for eight years a Member of Congress from Maryland and for twenty years recorder of the Supreme Court.

10. The Commander here referred to was Capt. William Compton Bolton, U. S. N.

11. This account is taken from the MS. of a memoir of Sir William Fergusson which Dr. Pinkney wrote on hearing of his death in 1877. There is evidence of a close friendship between the two men, and it is very probable that they corresponded. Nevertheless a courteous letter from the late Sir James Fergusson in Aug. 1924 (written just as he had passed his 90th birthday), states: "There are no letters of Ninian Pinkney in my Father's papers," nor have any Fergusson or Liston letters been found among Pinkney's papers, or elsewhere. A seal ring which Fergusson presented to Pinkney is now in possession of Miss Helena L. Pinkney of Washington, D. C. Pinkney himself died in December of the same year as Fergusson.

12. In 1837 considerable feeling against England had been aroused by the burning of the *Caroline*, an American armed vessel, by the Canadians. In addition the Oregon question loomed as a cause of dissension between the two countries.

13. Detailed accounts of the more important of these operations appeared in *Am. J. M. Sc.*, Oct., 1846, pp. 330–336.

14. Franklin Buchanan (1800–74), naval officer. In 1845 he organized the Naval Academy and was its first superintendent. He commanded the *Susquehanna* under Perry, in the Japan expedition. He resigned in 1861, but withdrew his resignation when Maryland failed to secede, but Secretary Welles refused to restore him. He then entered the Confederate service, and in the raid on the U. S. fleet in Hampton Roads in which the *Cumberland* was sunk, he was in command of the *Merrimac*. Owing to wounds received in the latter engagement he was not on the *Merrimac* in the famous encounter with the *Monitor* on March 9, 1862.

15. "Londonderry" was the name given to the Pinkney house near Easton, Md., which was designed by a prominent New York architect and cost in the neighborhood of $10,000. It was erected on land inherited by Mrs. Pinkney from her father.

16. James C. Pickett (1793–1872), Commissioner of Patents, 1835; chargé d'affaires in Peru, 1838–1845.

17. The Baltimore Directory for 1847–48 shows "Dr. N. Pinkney" at 35 Pleasant Street.

18. The Dr. Bache here referred to was Benjamin Franklin Bache (1801–81), great-grandson of Benjamin Franklin, who was born at Monticello, Va., and died in Brooklyn, N. Y. Dr. Bache was the founder of the naval laboratory and supply depot at Brooklyn, and won reputation as the great medical purveyor for the Navy in the Civil War.

19. Dr. Pinkney of the Navy asked leave to read a memorial which he had prepared to present to Congress, on the subject of assimilated rank . . . The memorial was read and explained by its author . . . Resolved unanimously to approve

the memorial, and that the bill prepared by Dr. Pinkney be approved. That we have listened with great pleasure to the able and eloquent remarks of Dr. Ninian Pinkney in vindication of the honor and interests of the profession, and that we will second his efforts to obtain justice at the hands of Congress by every means in our power. (*Minutes of the Fifth Annual Meeting of the Am. Med. Ass.*, Richmond, Va., May, 1852 *Trans. Am. Med. Assoc.*, 5: 2–3.)

20. The graduates numbered twelve only. Among the names were those of Montgomery Sicard and G. P. Lull.

21. *The Balt. Sun*, June 20, 1855.

22. The first attempt to lay the Atlantic cable was made early in the month of August, 1857, from Valentia, Ireland. The fleet detailed for service on this expedition consisted of eight vessels, four American and four British. Among the American vessels were the Steam Frigates *Niagara* and *Susquehanna*. The first attempt ended in failure on August 11th, after 345 miles of cable had been paid out from the *Niagara*.

23. John Pomeroy Dabney (1821–74), (son of Charles William Dabney (1794–1871), U. S. Consul) married Sarah Hickling Webster (1821–1909). Dabney was a name to conjure with at Fayal in the Azores, for several members of the family had been U. S. Consuls there and all were held in the highest esteem by the natives.

24. This reference is to John White Webster, M. D., notorious as the murderer of Dr. George Parkman of Harvard University. Webster was convicted and hanged. August 30, 1850. His "Description of the Island of St. Michael, an account of its Geological Structures with Remarks on the Azores" Boston, 1821 would indicate that he had himself visited the Azores.

25. These individuals were prominent divines and speakers of the day in the United States.

26. This was the first distribution by the Queen of the newly devised Victoria Cross. See Lee, Sir S. King Edward VII, A Biography. Macmillan, 1: 35.

27. HUTTON. Life of Bishop Pinkney. 1890, p. 90.

The only examples of letters by the elder Mrs. Pinkney which have survived thoroughly support this glowing estimate. One especially, addressed to her daughter-in-law on October 1, 1838, is singularly beautiful in its delicate sympathy toward the younger woman, who was at that time facing the prospect of motherhood.

28. "In 1843 he had the good fortune to be under Eagle, one of the most chivalrous officers of the Navy, a large-hearted man, who saw with pride and pleasure the enthusiasm of his young surgeon, then only thirty-two, and who did all in his power to advance him in his laudable thirst after fame." (Memoir by William Pinkney.)

Henry Eagle (1801–82), commodore (1862), made the first naval attack of War of the Rebellion in the gun-boat *Monticello*, silencing the guns of Sewell's Point battery, Virginia, May 19, 1861. Subsequently he commanded the frigate *Santee*, of the Gulf Blockading Squadron. While on the latter duty he organized a boat expedition which captured and destroyed the privateer *Royal Yacht*, in the harbor of Galveston, Texas.

(*To Be Concluded*)

STUDIES IN PALEOPATHOLOGY, XXIII

SURGERY IN PRE-COLUMBIAN PERU*

By ROY L. MOODIE, PH.D.

SANTA MONICA, CALIFORNIA

ANY account of pre-Columbian surgery, especially that of Peru, must deal with the intricate problem of prehistoric trephining. My immediate interests with trephined skulls consist in the evidences of surgical procedure which they bear. The present study is to be considered largely in connection with the study on pre-Columbian skull injuries.[1] It is the opinion of anthropologists that trephining was often performed for the relief of depressed fractures. No weapon makes such perfect depressed fractures as do the sling-shot stones, which I have already described. Since the slingshot injuries are usually small, any trephining done to relieve the decompression would need to remove all traces of the wound. The prehistoric surgeon always removed generous plaques of bone from the skull on which he was working. If, however, trephining was done for religious purposes, for releasing a penned-up demon, then we should expect, occasionally, to find sling-shot wounds on a trephined skull. Such I have not found.

Prehistoric cauterization is a field of surgery which has the greatest interest. It has been carefully given in my large volume.[4] As a counterirritant the actual cautery has for ages been an effective practice.

Definite osteologic evidence of excisions is limited to one skull, No. 86, Museum of Anthropology, Balboa Park, San Diego, California (Fig. 15, A and B). This indicates that some prehistoric surgeon had removed, successfully, a mass of material infected with the disease known as uta, a phase of Leishmaniasis. Other evidences of excisions are contained in the figures shown in pottery.

No limb bones showing the effects of prehistoric amputations have been seen, but the evidence is clearly shown in the pre-Columbian pottery.

Many fractured limb bones show such imperfect union that we cannot be sure the pre-Columbian Peruvian surgeon made any attempt to correct fractures. This subject will, however, be dealt with in detail in a later study.

Bandaging is known from a single example, which I have already described in detail.[5] Brief statements here will suffice.

Bone transplants are suggested in a fragmentary skull, No. 55, from Coyungo, Peru.

Pre-Columbian surgical instruments are interesting and will be discussed and figured here.

Otolaryngology was a special field of surgery[6] in pre-Columbian Peru. A few examples of this special field of work will be shown.

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* A number of research agencies have contributed small amounts toward the completion of this study. The American Association for the Advancement of Science through its Committee on Grants contributed toward some of the general expenses of travel and assistance. The Committee on Scientific Research of the American Medical Association contributed to the completion of the illustrations. I have further enjoyed the continued support of the Sigma Xi Society and the Graduate School of the University of Illinois.

MATERIALS

All material examined for this study is believed to be definitely of pre-Columbian age. The greater part, if not quite all, of the illustrations are based on skulls in the San Diego Museum of Anthropology in Balboa Park. A general account of this collection has already been given.[7]

Sixty-eight skulls in this museum show evidences of surgical interference. They bear the following catalogue numbers: Nos. 40, 55, 86, 87, 98, 113, 121, 130, 131, 229, 241, 243, 244, 250, 254–265, 268–289, 292–300, 302–315, 659, 749. The following skulls are shown in the accompanying illustrations: Nos. 55, 86, 121, 251, 254, 257–259, 262, 265, 271, 273, 278–280, 283, 284, 288, 292, 294, 299, 303, 308–311, 314. It was not always easy to select from such a mass of material suitable illustrations, in moderate quantity, to show the relation of surgery to injuries. I have no intention of showing all of the trephinings but I have been led aside in a few cases by examples of skulls of unusual interest. Additional material, belonging with this collection, as yet undescribed, is in the United States National Museum.

FIG. 1. MODERN TOWN OF SAN DAMIAN, PERU, IN HIGHLANDS NEAR LOCALITY OF CINCO CERROS, REGARDED AS HAVING BEEN PREHISTORIC FORT, IN AND AROUND RUINS OF WHICH SO MANY INJURED AND MORE THAN 45 TREPHINED SKULLS WERE FOUND. BUILDINGS ALL SHOW SPANISH INFLUENCE. (*After Hrdlicka.*)

Accessory objects, such as stone implements, surgical gauze and string bear, appropriate numbers and are referred to in the sections dealing with them.

Dr. Edmundo Escomel of Arequipa, Peru, has recently sent me notes and photographs which have proven useful. He has interested himself in the prehistory of Peru for a number of years.

There is a great deal of undescribed material in the Museo de Arqueologia Peruana at Lima, a study of which may modify some of the statements made in this paper.

HISTORICAL

Our knowledge of prehistoric surgery in Peru began in the seventies of the past century in the discovery by E. G. Squier, in a cemetery in the valley of Yucay, of an incomplete skull, which bore on the upper left frontal a sharply incised, undoubted trephine wound. This remarkable specimen is now preserved in the American Museum of Natural History in New York City. It has been described and figured many times, and still remains an object of great interest, in spite of the fact that hundreds of trephined skulls have been collected in Peru.

The standard description of ancient Peruvian trephined skulls is the paper by Muniz and McGee,[8] published thirty years ago. Muniz was at one time Surgeon-General in the Army of Peru, and travelled extensively through the lands of the Incas, collecting as he went some thousand crania of pre-Columbian Peruvians. In 1893 he took his collection to Chicago to exhibit at the World's Fair, and later at Washington he transferred a part of his collection to the Bureau of American Ethnology. In the Muniz collection were nineteen trephined crania, which are all that remain of his huge collections, the rest having been destroyed by fire during an insurrection at Lima. The technical descriptions were written by McGee.

Muniz, in his "Summary Statement," makes some unwarranted statements concerning the knowledge of surgery in pre-Columbian Peru, or at least some statements unsupported by facts. He says they knew how to reduce luxations effectively, but gives no data to substantiate his statement. No study of luxations in pre-Columbian Peru has ever been made and until such a study is made we shall not know whether the prehistoric surgeon could reduce dislocations or not. He says further that they employed fixation to consolidate fractures. This is not borne out by the nature of healed fractures which I have seen. His statement, "they possessed a perfect process of mummification" is misleading. Muniz doubts whether post-mortem operations were performed in prehistoric Peru, because of "the exaggerated veneration of the ancient Peruvians for their dead," nor has ever a fragment of bone been found which might have been used as an amulet.

McGee is responsible for the statement that the prehistoric surgeon closed the wound with some kind of a plate, because of the fact that the Kabyles do so, and that the South Sea islanders use a shell for this purpose. Among the hundreds of trephined crania which I have examined there has been nothing to show that the wound was ever closed by anything save a flap of the scalp. McGee's figures remain today the clearest reproductions of trephined skulls ever printed. In only one case has he shown an association of a previous injury with trephining, although he recognizes the importance of decompressed fractures as an inducing cause of the operation.

The next most important discussions, it seems to me, in our knowledge of prehistoric surgery, are two papers by G. G. MacCurdy.[2,9]

In his earlier paper,[9] MacCurdy gives a very readable and general account of surgery in pre-Columbian Peru, as it relates to trephining. He later[2] published the more technical descriptions in his monographic study of the collection of the Yale Peruvian expedition, with the exception of the material from Machu Picchu, described by Eaton.[10] Since no trephined skulls or other surgical evidences were found at Machu Picchu, we are not at present concerned with that very interesting locality. Since MacCurdy's two papers deal with the same collections, though published five years apart, we shall review here only his final contribution.[2]

MacCurdy[2] devotes thirty pages and many figures to a discussion of (a) surgery, (b) traumatism, and (c) pathology, all of which contain material of interest to us here. His conclusion, after an extended discussion of the evidence, that "a majority of the trepanations were to relieve depressed fractures," is noteworthy, although he does not figure all of his evidence to support such a decision. After a discussion of dental pathology he asserts, "They were experts as primitive races go in cranial surgery, but had not developed or perhaps even begun to develop dental surgery."

A paper written by a Peruvian educated in the United States, Dr. Julio C. Tello,[11] at the Museo de Arquelogia Peruana, Lima, is important. His material was selected from 10,000 crania and mummies. This paper is adequately discussed by MacCurdy, (Ref. 2, p. 240).

Shapiro's recent[12] contribution proves that much that is new may still be expected in the field of primitive surgery.

The preceding papers have dealt almost exclusively with trephining. It remains for Freeman[13] to review for us other phases of surgery. His paper is the more important to us here since he deals in part with the collection at San Diego. He discusses surgery under the following headings: (a) trephining, (b) anesthetics, (c) surgical instruments, (d) operation for brain tumor, (e) amputations, (f) the prehistoric medical profession, (g) therapeutic measures, (h) extraction of foreign bodies, (i) cupping, cauterization, scarification, phlebotomy, (j) operations upon internal organs, (k) treatment of fractures. Freeman's results and materials represent the relatively modern medical practices of the North American Indians, as well as the more ancient facts from Peru.

The most recent, and in many respects the most important, contribution to prehistoric surgery is the paper by Burton,[6] a practicing physician in San Diego. It comprises all the material issued previously by him, and constitutes an important addition to our knowledge of pre-Columbian pathology and surgery. Aural exostoses or osteomata appear frequently in the external auditory canal of ancient Peruvians. Their condition and relation to otosclerosis with the possible surgical bearings are discussed. An examination of the condition of the turbinates in the Peruvian crania reveals much of interest. Displaced choanae, nasal fistulae, septal deviation, fistulae penetrating into the antrum and nasal fractures all reveal interesting features. Dr. Burton discusses trephining in the left frontal sinus, as shown in a skull (Fig. 9 A, B, C) of the present paper. Two other skulls show evidences of operations in the region of the frontal sinus, evidently attempted to relieve "unbearable pain" in the lower forehead.

An important review of ancient Peruvian surgery, with the addition of some new material, is contained in a paper by Escomel.[21] This discussion is not generally available, since it appears not to have been issued in any journal or other series and no date is given.

It will suffice to give the subtitles of his paper:

a. La Uta y la Espundia en el Alfareria del Peru prehistórico.

b. El Labio leporino en el Arte peruano de La Epocha incaica.

c. La Craneotomia precolumbina en el Perú.

d. Conclusions:

The Peruvians of the Incan Empire possessed considerable medical and surgical knowledge.

The Incas employed craniotomy (trephining) scientifically, deliberately, doing it with a humane purpose.

The performing of such a delicate operation, tells us that they must also have known and practiced minor surgical operations.

The instruments used and known at the present were lamelate silex and the tumis of copper or bronze.

The trepanations of the Incas were not performed on the corpse.

Little is known as to the dressing of the wound.

TREPHINING

Surgery of the head, among the pre-Columbian Peruvians, was largely confined to trepanation or trephining, of which there are many examples known among the collections assembled from the burial caves, rock shelters and ancient cemeteries of Peru. Trephining has so often been described and universally commented upon that it will not be necessary here to go into much detail on the facts which are already known. My chief object in this section and in the illustrations has been to show the association of head injuries with the surgical wound. These evidences take the form of slight fractures around the border of the trephined area (Figs. 5 D; 7 B; 8 A, C, D, 10 B; 11 A; 12 C, D; 13 A, B, C; 14 A, C). An examination of the results of my previous paper[1] will show that the small fractures accompanying the trephined areas are the results of depressed injuries, such as have been shown to accompany sling-shot wounds.

The surgical methods employed by the prehistoric surgeons fall into four more or less distinct groups. Probably the most prevalent was scraping, and the results are here shown in Figures 4 A, C, D; 5, A, C; 6 A, B, C, D; 7 A, B; 9 D; 10 A, C, D; 12 B (this Neolithic skull shows evidences of cutting also). In the process of scraping flakes of flint, obsidian, quartz, and possibly also in the later periods instruments of copper-bronze were used. Some of the flakes shown in Figure 2 C, G, M, N, O, Q, R, T, may have served the purposes of the primitive surgeon. It is probable that the ancient Peruvian surgeons did not reserve any of the objects for this particular purpose, but that they picked up any suitable object, and as readily discarded it after the work was completed. Burton finds evidence[6] to suggest the presence of specialists in surgical technique at Cinco Cerros, in which case it is possible that the crude instruments were kept for this special purpose. Each operator may have had some favored obsidian flakes which he kept by him

Another favorite method of opening the skull was by sawing. The results of this method are shown in Figures 5 D; 7 C, D; 8 B; 9 A, B; 10 B; 11 A, B, C, D; 12 A, C, D; 13 B, C. Some trephined areas show the results of a combination of sawing and scraping, as is illustrated in Figure 8 C. It may have been quite a prevalent technique; sawing through the skull bones was doubtless performed by some such

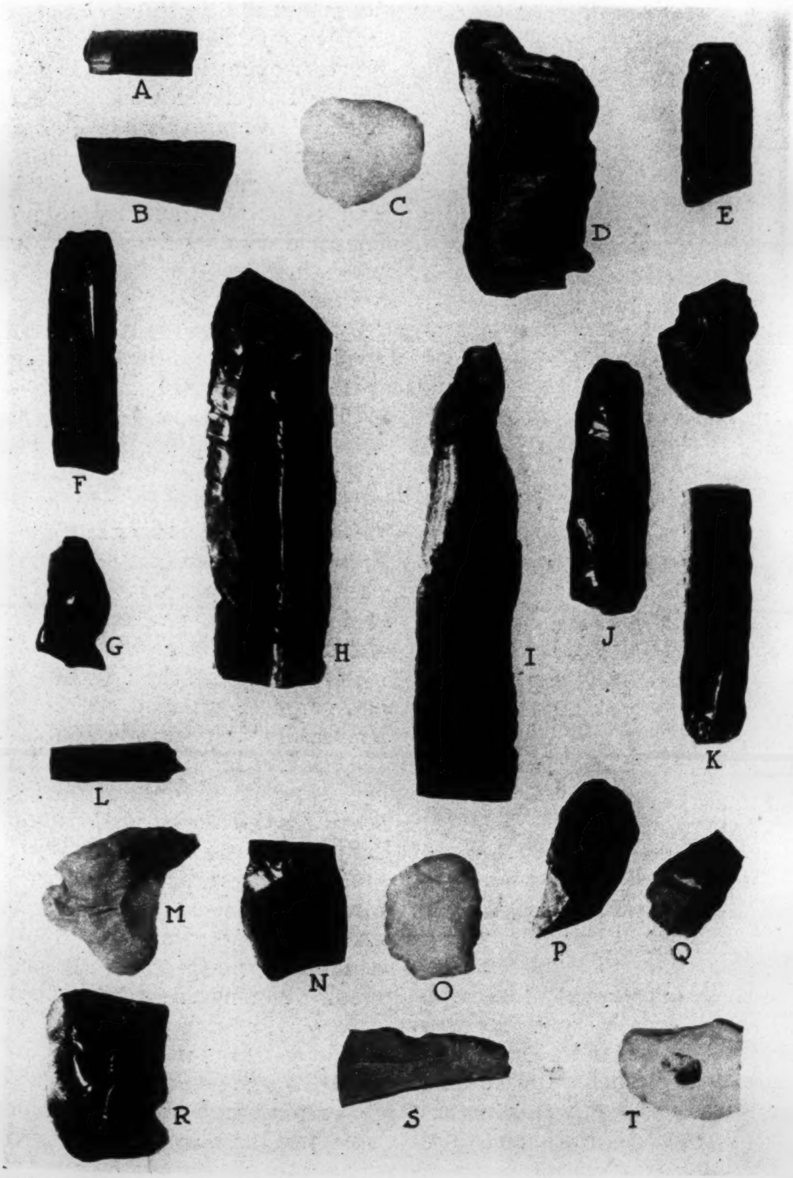

Fig. 2. Ancient Artefacts of Obsidian and White Quartz Possibly Used by Prehistoric Surgeons in Peru in Making Incisions, Cutting, Sawing, Drilling and Scraping Skull Bones in Trephining. Not Used Exclusively by Pre-Columbian Surgeons for Surgical Purposes. Undoubtedly Used for Ordinary Household Purposes, Such as Preparation of Skins, Making Wooden and Bone Implements etc. The Flakes Shown in a, b, e, j, l and s May be Parts of Drills. Those Shown in f, h, i and k May Have Served as Knives. The Serrated Edges of h, Shown in Figure 3, May Have Rendered This Useful as a Saw, for Cutting Curved Incisions in the Skull Bones. The Flakes Shown in c, d, g, m, n, o, p, r and t May Have Been Used as Scrapers. All Specimens Shown (About ⅔ Natural Size) are in the San Diego Museum of Anthropology.

instrument as the obsidian flake, with serrated edges, shown in Figure 2 H; and Figure 3, where the details are made clear in an enlarged photograph. Many of the curved sawn incisions depicted on these skulls may well have been done by such an instrument. Sawing seems to have been practiced in many operations which appear to have been post-mortem. I can conceive of no other explanation for such incisions as those shown in Figures 7 C; 11 B, C, D, and others not illustrated than to suppose that they represent practice operations on the dead. None of the skulls so operated show injuries, and all are of unusually heavy bone. Muniz[8] denies that post-mortem operations were done, basing his denial on the ancient Peruvians' supposed veneration of the dead.

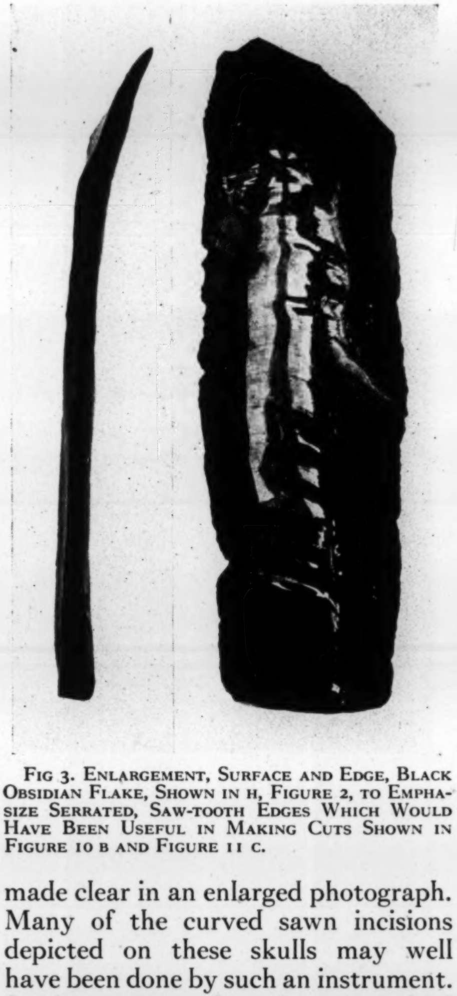

Fig 3. Enlargement, Surface and Edge, Black Obsidian Flake, Shown in H, Figure 2, to Emphasize Serrated, Saw-tooth Edges Which Would Have Been Useful in Making Cuts Shown in Figure 10 B and Figure 11 C.

A third method, by cutting, could have been done by such an instrument as the one shown in Figure 2 I. The results of cutting are shown in Figure 4 B, and cutting combined with sawing in Figures 14 A, B, C, D, E; and 16. Cutting was also employed to round out the openings made by drilling, as shown in some of the skulls depicted by MacCurdy.[9] Results by cutting are rare in the San Diego collection.

Skulls which show the results of trephining by drilling are very rare. I know of only two such skulls. One is described herewith in Figures 8 A, D and 13 A; and the other is a skull depicted by Lucas-Championnière,[14] as preserved in the Musée du Trocádéro. The unusual results figured by Escomel[15] seem to have been made by cutting instruments. Attention is especially called to the association of a small fracture with the operation by drilling, illustrated in this paper.

Infections seem to have most frequently followed the operation by scraping where a large area was denuded of periosteum. Such infected areas are shown in Figures 4 D; 6 C, D and 10 A. It seems that infection is not nearly so common following the other methods of opening the head.

We may now consider the reasons why this surgical operation was so frequently performed on the head of the ancient Peruvians. There are some interesting facts which indicate that trephining was a military procedure. At the necropolis of Ancon near the coast of Peru, no trephined skulls have been found. This indicates a peaceful population, an agricultural, pastoral group who had no violent humors. No trephined crania were found near the ancient city of Machu Picchu, a place inhabited by vestals, devoted to an attendance on the worship of the Sun. At Cinco Cerros it is supposed an ancient fort had been established. Here were found numbers of trephined crania. Many skulls showing injuries also occur here, a large part of them with sling-shot wounds. Hence we find a suggestion of the cause of trephining.

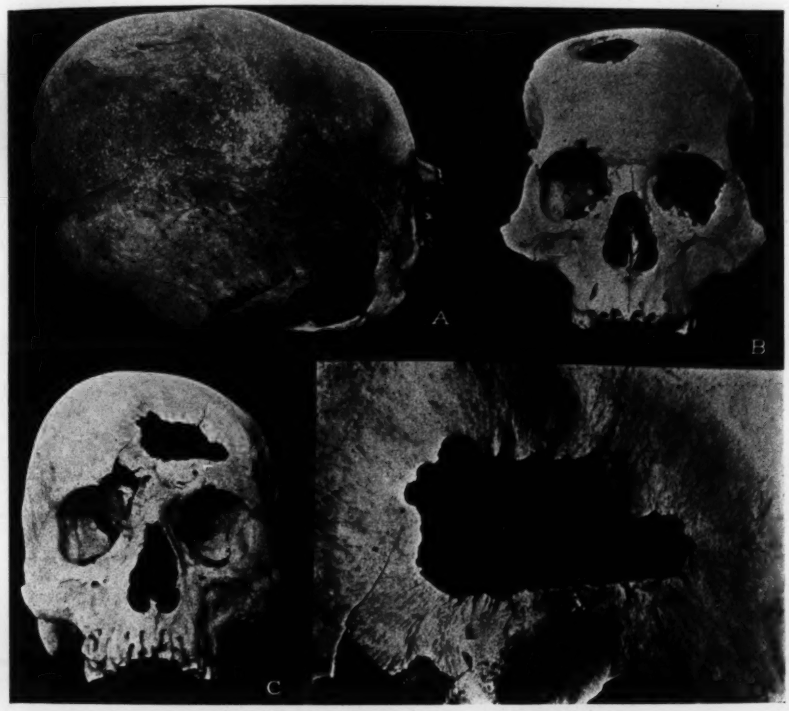

FIG. 4. TREPHINED SKULLS FROM PRE-COLUMBIAN PERU.

A: MALE PREHISTORIC SKULL NO. 121, AYMARA DEFORMATION SHOWING APPARENT EVIDENCE OF INCOMPLETE TREPHINING, NEAR VERTEX, ANTERIOR THIRD OF SAGITTAL SUTURE. IT IS RATHER UNUSUAL FOR SKULLS OF THIS TYPE OF INTENTIONAL DEFORMATION TO SHOW EITHER TREPHINING OR ACCIDENTAL INJURIES. SKULL PHOTOGRAPHED OBLIQUELY TO SHOW POSITION OF LESION.

B: MALE PREHISTORIC SKULL, NO. 251, IN THE SAN DIEGO MUSEUM, SHOWING A TREPHINED OPENING, 50 MM. X 30 MM., WITH BEVELED EDGES IN THE POSTERIOR PART OF THE RIGHT PARIETAL; POSSIBLY MADE BY CUTTING. NO ACCOMPANYING EVIDENCES OF INJURY. FROM NEAR HUAROCHIRI, PERU.

C: MALE PRE-COLUMBIAN SKULL, NO. 254, SHOWING ASSOCIATION OF INJURY AND SUBSEQUENT TREPHINING. THE INJURY IS IMMEDIATELY ABOVE THE BRIDGE OF THE NOSE, WHICH WAS INFECTED. THE HEALED TREPHINE OPENING, MEASURING 50 MM. X 30 MM., IS LOCATED ABOVE THE INJURY, SUPPURATION FROM WHICH HAD EXPOSED THE LEFT FRONTAL SINUS.

D: DETAILS OF THE TREPHINE OPENING IN SKULL NO. 254, SHOWING THE SMOOTH, HEALED MARGINS OF THE OPENING. THE TRAUMATIC LESION IS BELOW AND THE OPENING INTO THE FRONTAL SINUS IS SHOWN IN THE MIDDLE OF THE PICTURE BELOW. I REGARD THE TWO SHARP CRACKS EXTENDING INTO THE TREPHINED OPENING AS OF POST-MORTEM ORIGIN, POSSIBLY DUE EITHER TO DESICCATION, OR POST-EXHUMATION ROUGH HANDLING.

The following may be regarded as inducing causes of the operation:

(a) depressed fractures, due to sling shot or other injuries. The skulls depicting that type of injury associated with trephining have been listed above.

(b) Post-mortem practice operations. There is no evidence to show that amulets, removed at these operations, were preserved. Muniz[8] states emphatically that no scrap of bone resembling an amulet has ever been found in Peru. Later students support his conclusions.

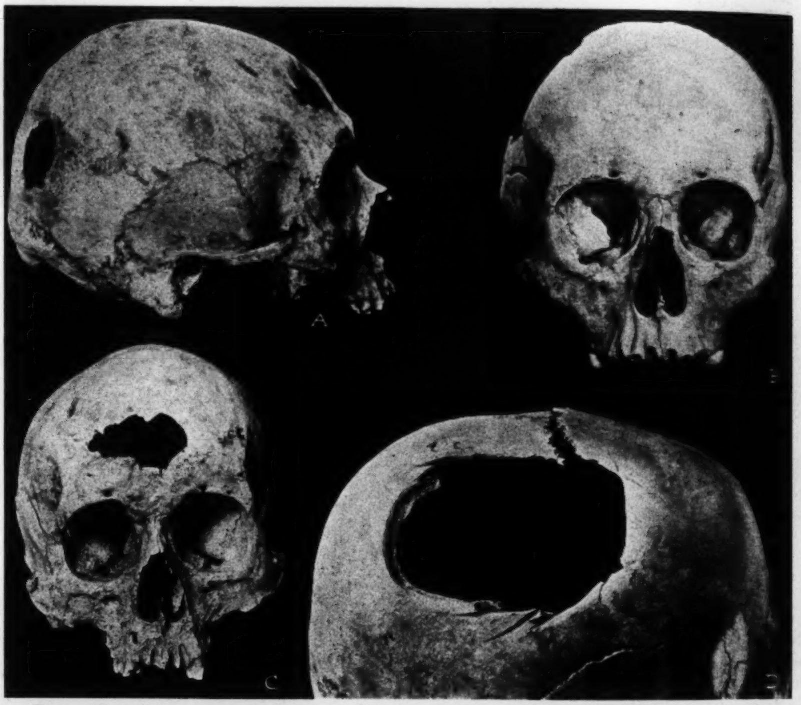

Fig. 5. The Association of Injuries and Trephining in Two Pre-Columbian Skulls.

A and C Represent Male (?) Skull No. 258, from Ruins of Prehistoric Fort, Cinco Cerros, Showing Double Trephining, Shown Well in A. Both Openings Show Considerable Restitution of Bone. The Frontal Area, Denuded of Periosteum by Scraping, Measures 60 Mm. × 40 Mm.; While the Parietal Area Measures 50 Mm. × 40 Mm. It is Possible that This Individual was a Soldier and Trephining in This Case was the Procedure of Some Military Surgeon.

B and D Represent Female Prehistoric Skull No. 257, Showing the Very Definite Association of a Fracture at the Lower Right Angle of the Trephined Area in D. The Opening is Huge, Measuring 80 Mm. × 55 Mm. with Straight and Curved Cuttings Such as Could Have Been Made by an Obsidian Flake as Shown in Figure 3 and Figure 13, C.

(c) For the relief of unexplained and unbearable pain, such as is common in sinus infections. Three skulls in the San Diego collection show the effects of operations on the frontal for the relief of such pain (Figs. 4 D; 5 A, C; 9 A, B, C.

(d) For the relief of endocranial pressure. Burton[6] regards the operation shown in Figure 10 B as having been performed for the removal of a cerebellar tumor. The fractures to the right, however, might suggest another cause i.e., endocranial hemorrhage.

(e) For melancholia. I have suggested elsewhere that cauterization may have been employed for this purpose, also. Only one Peruvian skull, however, shows the effects of distinct cauterization.

(f) For unexplained, and possibly religious or superstitious reasons, a small number may have been tre-

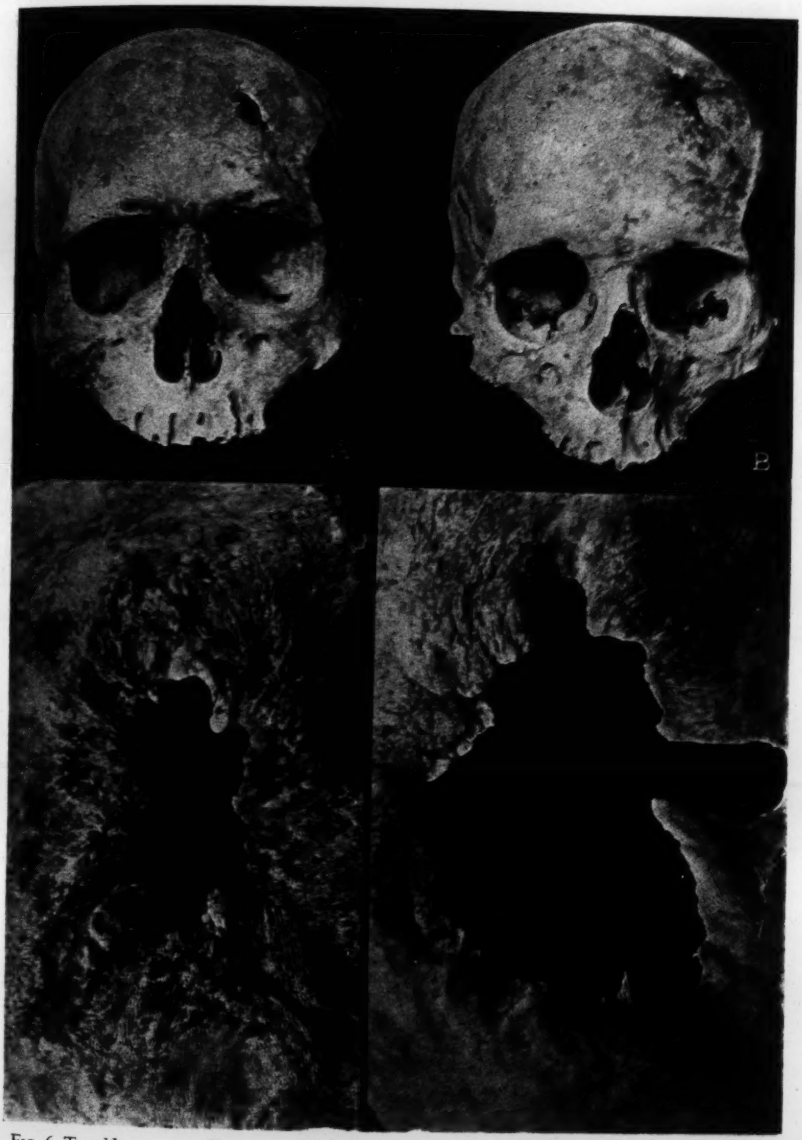

Fig. 6. The Healing of Trephined Wounds in Three Pre-Columbian Skulls from Peru.

a. An Example of Ancient Trephining by Scraping, in Skull No. 259, from Cinco Cerros, of an Old Soldier, with Opening Almost Healed. Traces of an Old Fracture for Which Trephining May Have Been Done. Scraped Area Almost Circular 60 Mm. in Diameter. Opening 18 Mm. in Diameter.

b and c Show the Location (b) and Nature (c) of an Ancient Scraped Infected Area, 90 Mm. in Diameter, in Which Is Located the Trephined Opening, 11 Mm. × 30 Mm. in an Elderly (About Forty) Male from Cinco Cerros, Peru.

d. An Unusually Large Trephined Opening 70 Mm. × 55 Mm., in a Scraped, Infected Area, 125 Mm. in Diameter. Male Skull, No. 262, from Cinco Cerros, Peru. Signs of a Previous Injury for Which Trepanation May Have Been Done.

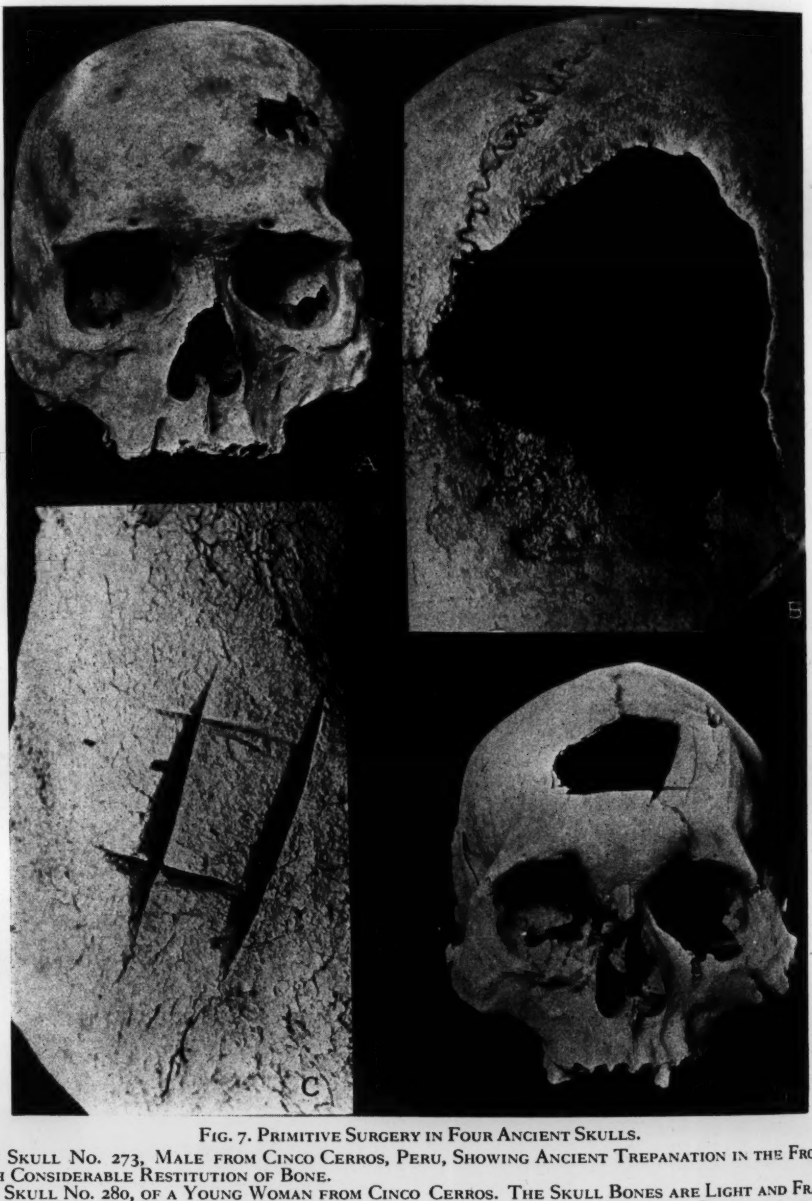

Fig. 7. Primitive Surgery in Four Ancient Skulls.

a: Skull No. 273, Male from Cinco Cerros, Peru, Showing Ancient Trepanation in the Frontal, with Considerable Restitution of Bone.

b: Skull No. 280, of a Young Woman from Cinco Cerros. The Skull Bones are Light and Fragile. The Huge, 60 Mm. × 75 Mm. Opening Shows Considerable Healing. There is a Lesion at the Left Bregma Which May Have Induced Trepanation.

c: This Skull, No. 271, a Male from Cinco Cerros, Shows Double Trephining; One in Frontal and One in Parietal. The Area Shown Contains an Incomplete Operation by Sawing. The Right Hand Incision Measures 40 Mm. in Length, 3 Mm. in Greatest Width. The Site Lies 30 Mm. from the Upper Border of the Left Orbit. The Rectangular Area, Intended for Removal, Measures 12 Mm. × 19 Mm. The Scaly Appearance of the Bone is Due to Weathering, Having Been Thrown Out of the Grave by Vandals Searching for Pottery or Ornaments.

d: This Unusual Skull, No. 279, a Male from Cinco Cerros, is Badly Shattered. The Bones are Papyraceous, Measuring Less than 2 Mm. in Thickness. The Opening in the Frontal, 30 Mm. × 42 Mm., Was Doubtless Done for the Relief of Pre-existing Injuries. There is an Extensive Injury in the Right Orbit.

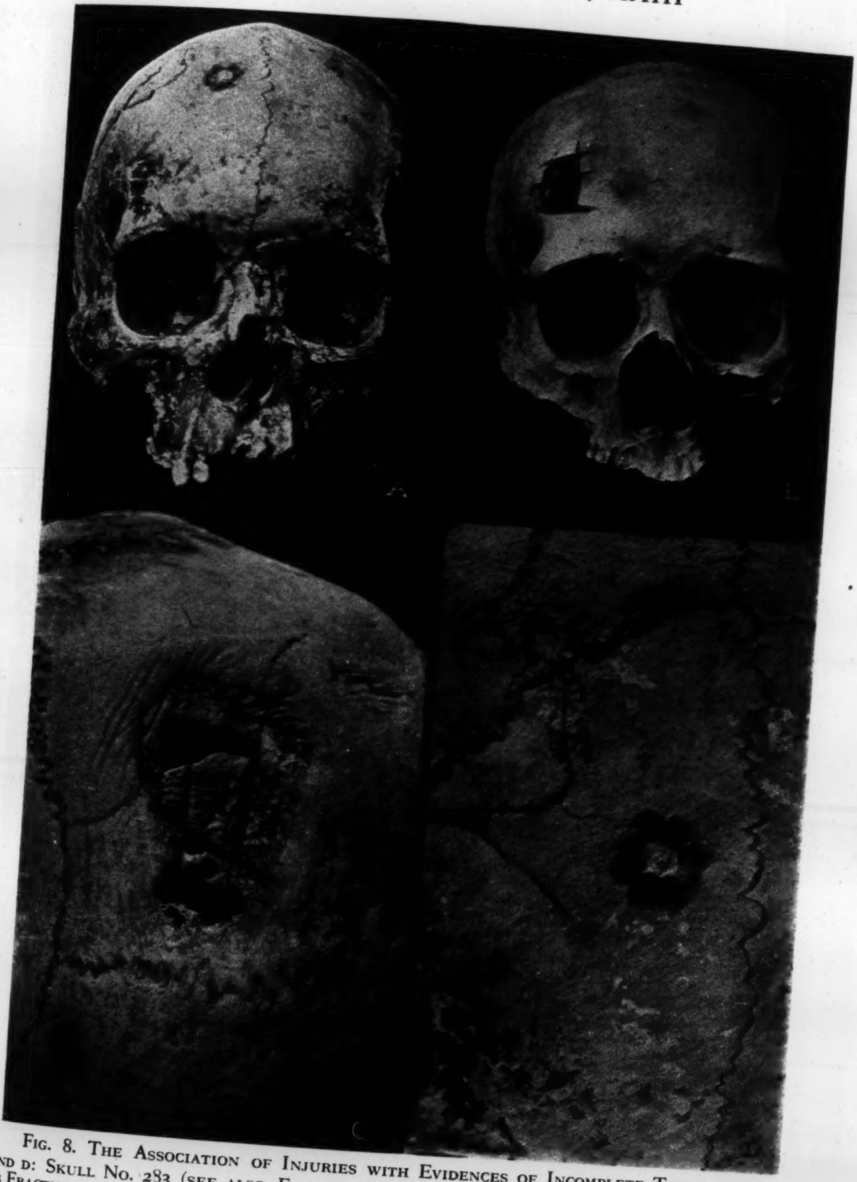

Fig. 8. The Association of Injuries with Evidences of Incomplete Trephining.

a and d: Skull No. 283 (see also Fig. 13 a), a Female, from a Cemetery at Matucana, Peru, Shows Fracture of the Vault, Following in Part the Coronal Suture, with Evidences of Attempted Trepanation by the Very Rare Method of Drilling. The Surgeon Intended to Lift Out the Rondelle and Cut Down the Edges. This May Explain the Technique of Many of the Circular Trephinings Seen in Ancient Peruvian Skulls. The Drillings Seem to Have Partly Healed Edges.

b: An Unusual Type of Incision by Sawing and Cutting in the Right Frontal of an Ancient Peruvian from Cinco Cerros. No. 294. The Opening Measures 18 Mm. × 20 Mm. There is an Injury Near the Median Line of the Frontal.

c: A Definite Association of Fracture and Trephining Is Shown in This Pre-Columbian, Male Peruvian from Huarochiri, No. 284. Double Trepanation Was Attempted, One in Each Parietal, and Both Incomplete. The Coronal Suture Is Shown to the Left of the Picture. In the Large Trephined Area Three Fractures Are Clearly Shown. Specimen Shows Beyond Question that This Surgical Operation Was Attempted for the Relief of a Depressed Fracture. The Operator Was Unskilled, and Seems to Have Attempted Trephining by Cutting, Sawing and Scraping, Scattering Evidences of His Unskilled Hand over an Area 55 Mm. in Diameter. Why the Operation Was Abandoned is Uncertain, but the Edges of the Bones Show Evidences of Some Healing, So the Patient Did Not Die on the Table.

phined. No definite evidence is available on this point. It is probable that all surgical procedures were influenced by superstition, and none may be regarded as the rational thing for a reasoning being to do.

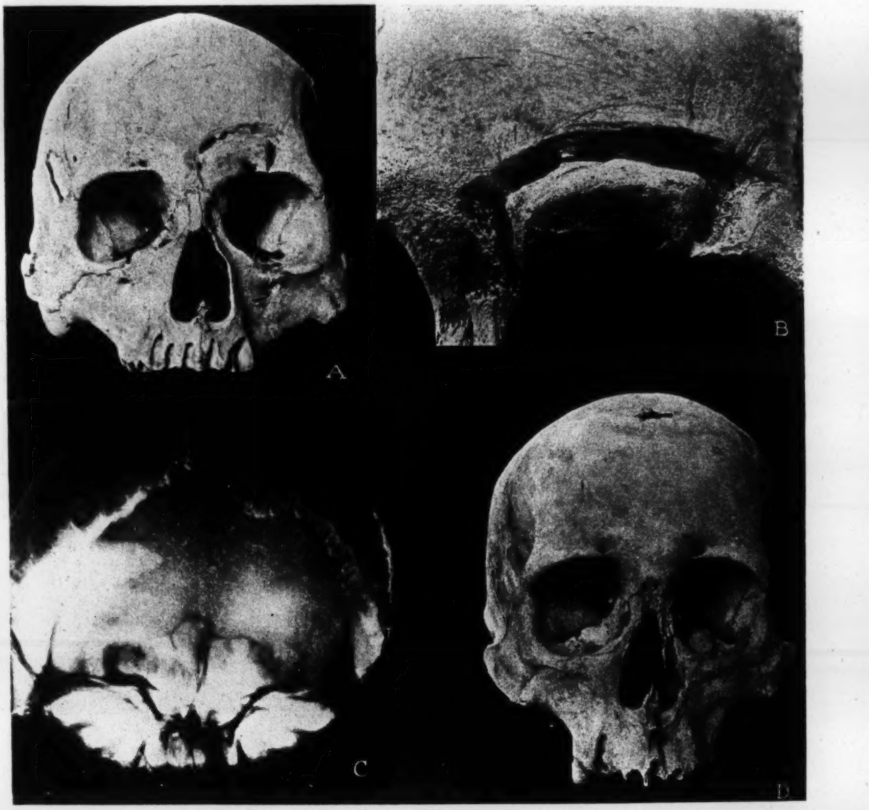

Fig. 9. Surgery of the Frontal Sinus. a, b and c Show the Location (a), the Extent (b), and the Roentgenographic (c) Appearance of a Most Rare Operation on Skull No. 288, a Male from Cinco Cerros. The Roentgen-ray Does Not Show Any Disease or Injury to the Frontal Sinus, and We Must Face the Idea that Trephining Here May Have Been Accidental, but It Seems Reasonable to Suppose that Pain in This Region was Unbearable and the Sufferer Believed that a Disaffected Spirit Was Trying His Hardest to Make an Escape, Due Possibly to an Empyema of the Frontal Sinus (Burton).

d: Healed Trephining in a Female Skull, No. 292, from Cinco Cerros, Peru. A Woman Soldier or a Camp Follower. No Injury Evident.

I shall make no attempt to list any part of the anthropological literature relating to trephining. The number of publications on this subject is extensive, and we are not considering the features of trephining other than the surgical aspects. Nor will it add to our purpose to review the geographical distribution of trephining in Peru. MacCurdy[2] has already done this very well.

We shall consider briefly the four methods of trephining the skull used in pre-Columbian Peru, and illustrate examples of each. The methods were those of sawing, cutting, scraping and drilling. The last one is extremely rare.

An attempt has been made to trace

down the authenticity of the statement often made in the literature that the trephine opening was stopped with a piece of gourd, a plate of silver, or other resisting material, the skin of the head being sutured above it.

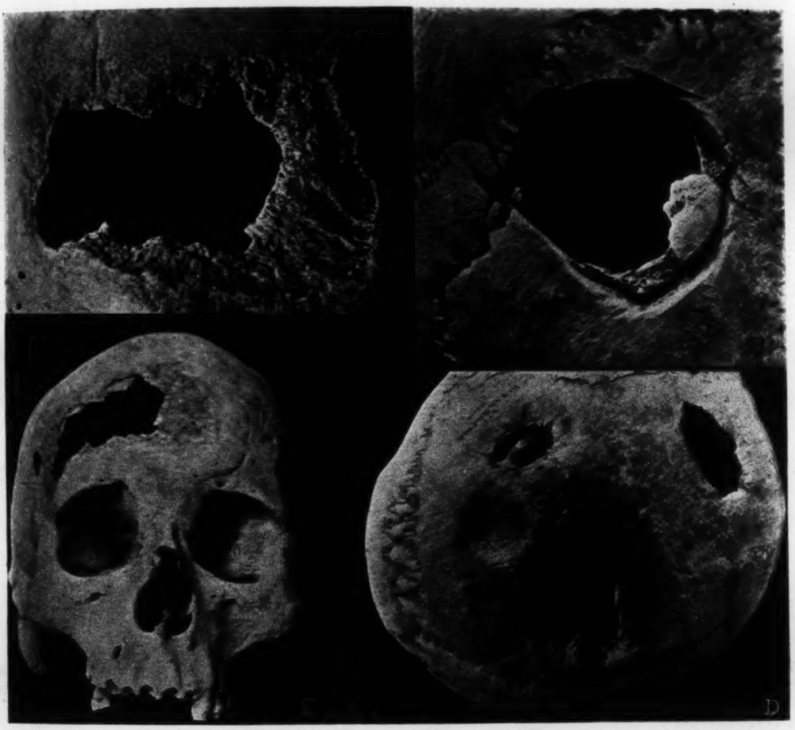

Fig. 10. Various Types of Trephined Openings.

a and c Represent the Location (c) and the Extent (a) in a Male, Pre-Columbian Peruvian, No. 303, from Cinco Cerros. The Margins of the Opening (65 Mm. × 30 Mm.) Show Signs of Infection (a).

b; A Definite Association of a Basal Fracture (to the Right) with an Unusual Trephined Area, by Sawing, Opening 40 Mm. in Diameter, in the Right Occipital of a Male Skull, No. 299, from Cinco Cerros. The Occipital on the Right Side Projects Prominently, Due to Cradleboard Deformity. The Basal Fracture Runs Posteriorly to the Foramen Magnum. The Trephining Was Incomplete; the Patient Dying on the Operating Table. In This Case Probably a Stone Bench, or the Ground.

d: This Male Skull, No. 310, from Cinco Cerros, Peru, Shows 4 Trephinings; 3 of Them Unhealed Escomel Has Described a Skull with 5 Openings.

Embalming may not be considered a phase of surgery, but its practice indicates some anatomical and surgical knowledge. Its vogue among the ancient Egyptians has been considered in great detail by G. Elliot Smith.[3] Statements are found in the literature such as, "Lastly they possessed a perfect system of mummification," i.e., the pre-Columbian Peruvians. This implies embalming. The question of pre-Columbian mummification has never been studied in all of its implications and the field is one of great interest.

During the years in which I have been accumulating material for this paper I have sought eagerly for definite evidence that the pre-Columbian Peruvian surgeon used a plate of gourd, a piece of silver, shell or other means of stopping the huge trephined opening. McGee[8] has discussed this question but his statements are not trustworthy, for he quotes the work which has been done by the Kabyles as ending with the closure of the large irregular opening by a plate. Hilton-Simpson[16] however, states: "None of the surgeons apply stitches to the scalp, and none attempt to replace the bone removed by any form of artificial plate." McGee further states that the South Sea Islanders, (which ones he does not state) used a carefully prepared piece of cocoanut shell. He gives no reference for this statement and so far as I

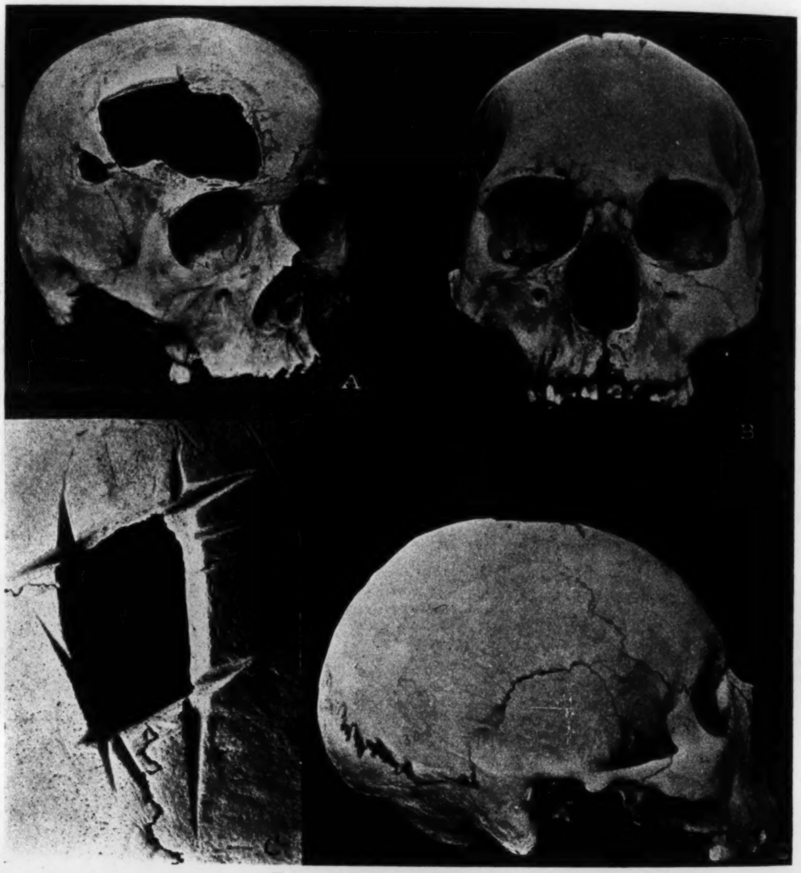

FIG. 11. ANCIENT TREPHINING.

A: SKULL NO. 311, PROBABLY A MALE, FROM CINCO CERROS, SHOWING DOUBLE TREPANATION IN FRONTAL AND RIGHT PARIETAL, FOLLOWING AN INJURY. MARGINS OF LARGE OPENING INFECTED.

B, C AND D SHOW IN SKULL NO. 308, A FEMALE FROM SAN DAMIAN, PERU, OF THE AYMARA TYPE, THE LOCATION AT THE VERTEX, FACE VIEW (B), THE NATURE (C), AND EXTENT (D) OF AN UNEXPLAINED TREPANATION, BY SAWING AND CUTTING. THE SKULL BONES ARE VERY THICK, HEAVY AND COMPACT, ALMOST IVORYLIKE, WITH DIPLOIC SPACES GREATLY REDUCED. THERE ARE NO SIGNS OF INJURY OR DISEASE IN THIS SKULL, AND WE CANNOT EXPLAIN THIS UNHEALED TREPANATION ON ANY DETERMINED BASIS. WE MIGHT REGARD THIS AS AN EXAMPLE OF A POSTMORTEM PRACTICE OPERATION. THE OPENING MEASURES 34 MM. × 20 MM. THE LONGEST INCISION IS 56 MM. IN LENGTH. NUMEROUS SCRATCHES ADJACENT TO THE OPENING INDICATE THE OPERATOR'S LACK OF SKILL IN SURGICAL TECHNIQUE.

know, it has not been confirmed. In the Field Museum there is a skull with silver plates, but these thin, perforated disks are placed over the cheeks, and have nothing to do with surgery.

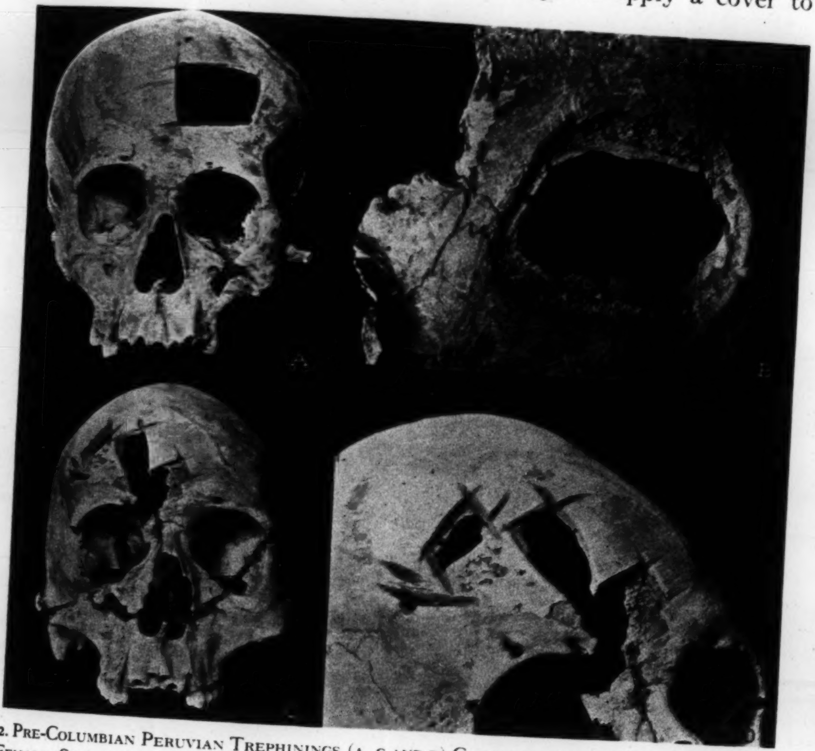

FIG. 12. PRE-COLUMBIAN PERUVIAN TREPHININGS (A, C AND D) COMPARED WITH A NEOLITHIC TREPHINING (B).

A: FEMALE SKULL, NO. 314, FROM CINCO CERROS, PERU, SHOWING LARGE TREPHINING BY MULTIPLE CUTTINGS. TRACES OF A PRE-EXISTING INJURY.

B: AN EXAMPLE OF NEOLITHIC TREPHINING, BY CUTTING, IN THE RIGHT FRONTO-PARIETAL. COLLECTED AT LOVOSICE, BOHEMIA, BY PROFESSOR I. WOLDRICK, AND PRESERVED IN THE SAN DIEGO MUSEUM. THE EDGES OF THE WOUND SHOW SIGNS OF INFECTION AND SOME HEALING.

C AND D: SKULL, NO. 309, A MALE FROM CINCO CERROS, PERU, SHOWING MULTIPLE OPERATION BY CUTTING AND SAWING FOLLOWING AN INJURY, IN THE RIGHT HALF OF THE FRONTAL. PATIENT SEEMS TO HAVE SURVIVED THESE FOUR OPERATIONS.

The conclusion warranted by the facts, as at present known, is that no plate was used by the primitive surgeon for this purpose. On an ancient Peruvian skull, of which Dr. Edmundo Escomel has sent me a photograph, there is a sharply incised groove which parallels the upper border of a large trephine wound in the left parietal. This may indicate an attempt to apply a cover to the wound, the groove preventing the object from slipping. The matter, however, is still open for study.

There is nothing to show that the skin flaps were sutured over the trephine wound. Hilton-Simpson says the Algerians did not suture the scalp. Suitable needles are mentioned by Garcilasso de la Vega. These needles of thorn or plant spines, 83 mm. in length, were discovered and figured by Eaton (Ref. 10, pl. 1, Figs. 5, 6). The use of bronze tweezers (Ref. 10, pl. 1, Fig. 2) is problematical.

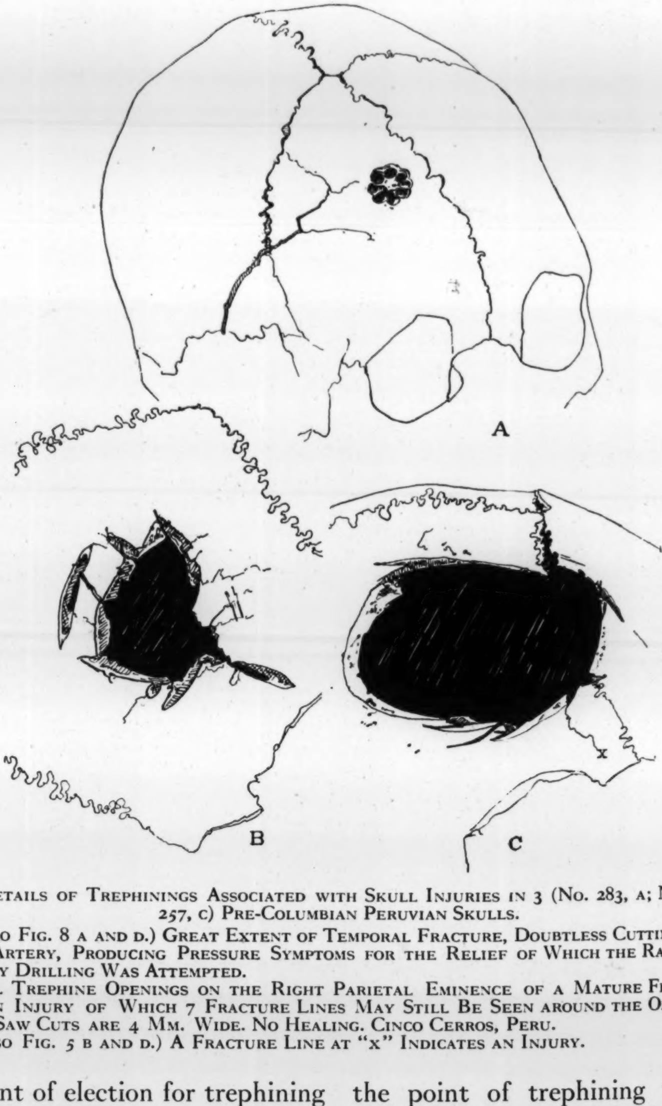

FIG. 13. DETAILS OF TREPHININGS ASSOCIATED WITH SKULL INJURIES IN 3 (NO. 283, A; NO. 278, B; NO. 257, C) PRE-COLUMBIAN PERUVIAN SKULLS.

A: (SEE ALSO FIG. 8 A AND D.) GREAT EXTENT OF TEMPORAL FRACTURE, DOUBTLESS CUTTING THE MIDDLE MENINGEAL ARTERY, PRODUCING PRESSURE SYMPTOMS FOR THE RELIEF OF WHICH THE RARE METHOD OF TREPHINING BY DRILLING WAS ATTEMPTED.

B: UNUSUAL TREPHINE OPENINGS ON THE RIGHT PARIETAL EMINENCE OF A MATURE FEMALE, FOR THE RELIEF OF AN INJURY OF WHICH 7 FRACTURE LINES MAY STILL BE SEEN AROUND THE OPERATED AREA. SOME OF THE SAW CUTS ARE 4 MM. WIDE. NO HEALING. CINCO CERROS, PERU.

C: (SEE ALSO FIG. 5 B AND D.) A FRACTURE LINE AT "X" INDICATES AN INJURY.

The point of election for trephining has often been discussed. Ruffer maintained that it was determined by the convenience of the operator. Many other suggestions have been made, but no definite conclusion has been drawn from this study. As a matter of fact the skull was trephined at any point of its surface, and I believe the point of trephining was determined by pain, and by injury.

An interesting example of intentional deformation of the skull is quite common in ancient Peru. This deformation is produced by circular constriction and results in elongation of the skull. MacCurdy[2] has written of the changes which follow this deformation. In my studies I have been struck by the infrequence of the occurrence of injuries on skulls with Aymara deformation, and still more by the rarity with which these interesting crania show the effects of trephining. Can it be that these people with the tall skulls were of the wealthy, leisure class, or of the ruling class, and so kept their precious heads out of danger? The skull shown in

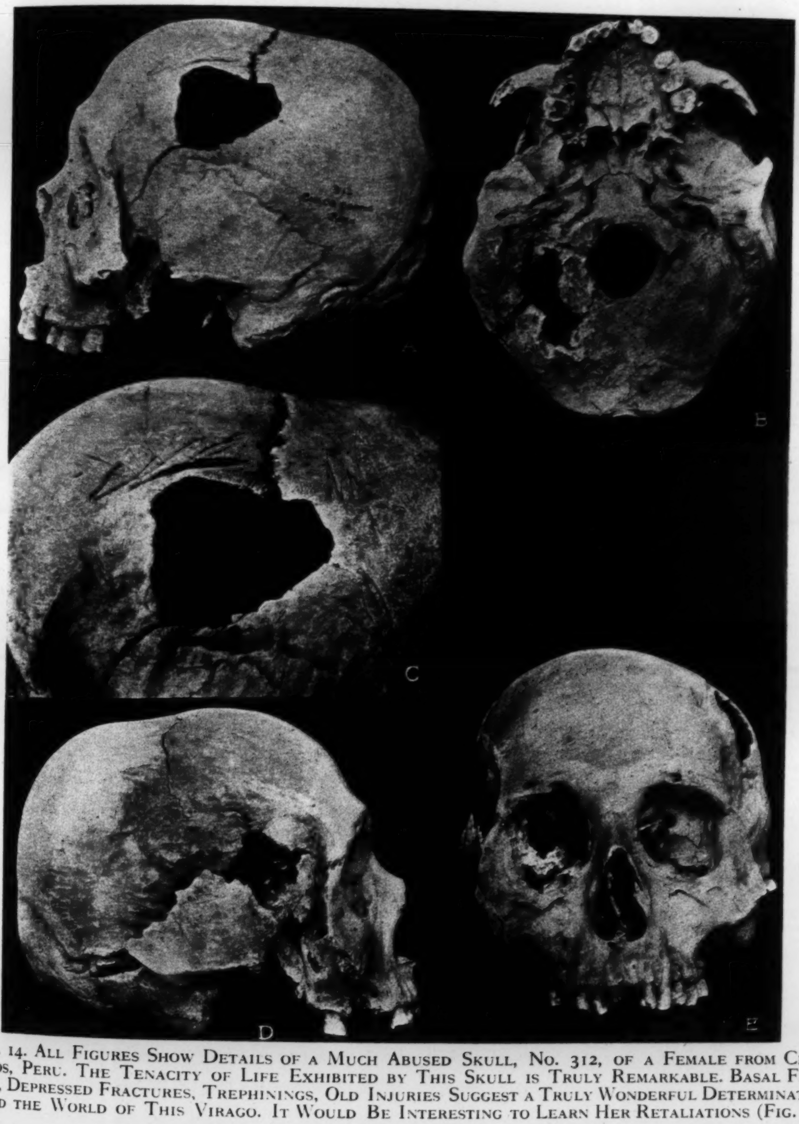

FIG. 14. ALL FIGURES SHOW DETAILS OF A MUCH ABUSED SKULL, NO. 312, OF A FEMALE FROM CINCO CERROS, PERU. THE TENACITY OF LIFE EXHIBITED BY THIS SKULL IS TRULY REMARKABLE. BASAL FRACTURES, DEPRESSED FRACTURES, TREPHININGS, OLD INJURIES SUGGEST A TRULY WONDERFUL DETERMINATION TO RID THE WORLD OF THIS VIRAGO. IT WOULD BE INTERESTING TO LEARN HER RETALIATIONS (FIG. 16).

Figure 4 A is of this type. It presents an incomplete trephining by scraping, and on the very vertex of the cranium. There is no obvious reason why trephining should have been attempted at this point in the living Aymara cranium, for the wound shows healing. There is a large number of crania showing the Aymara deformation in the San Diego Museum and a still larger number in the National museum, but a very small percentage of them show either injury or trephining.

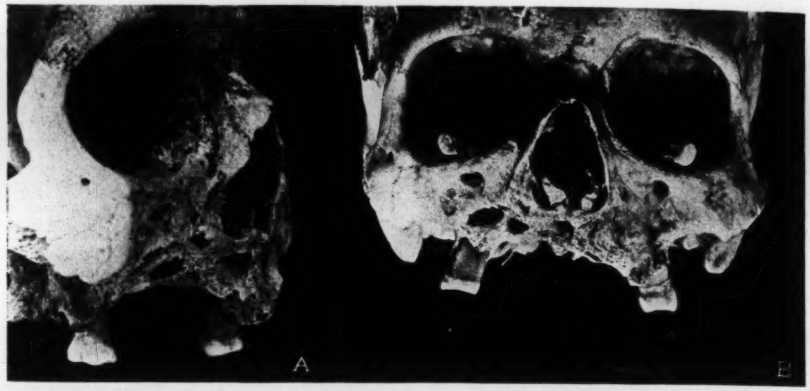

Fig. 15. A Pre-Columbian Skull, No. 86, from Chavina, Peru, Showing at A an Oblique View and at B, a Full View of Face of a Small Individual the Ravages of "Uta," a Phase of Leishmaniosis, Which Since Ancient Times Has Afflicted the Soft Parts and Cartilage of the Face. This Skull Looks Like the Results One Would Expect to Find if a Surgeon Has Cut Away the Diseased Tissues with a Knife (Pl. cxi Figs. b, c, d, e, f, of My "Paleopathology").

Garcilasso de la Vega (Ref. 17, II, p. 442) discusses briefly intentional, cradle-board, deformation of the child's head by Peruvian mothers.

An extreme example of Aymara deformation is shown by Freeman (Ref. 13, Fig. 7). This skull had been trephined at the apex, in order, so thinks Dr. Posnansky of La Paz, Bolivia, to relieve the endocranial pressure due to the binding of the head, and the consequent reduction of endocranial space. This operation was done by the rare method of cutting circularly, removing fragments of bone from time to time. Dr. Escomel of Arequipa has sent me a photograph of a skull in his collection showing a similar concentrically cut groove.

CATALOGUE DATA FOR THE TREPHINED SKULLS

Since the greater part of the evidences of prehistoric surgery in Peru is to be found in trephined skulls it will be important here to give the detailed catalogue data of the trephined skulls in the Museum of Anthropology at San Diego. This will enable those interested in the subject to find more readily what the nature of the material is. All specimens were collected by Dr. Ales Hrdlicka, and the catalogue was prepared by him. The list shows that a majority of the skulls were collected at Cinco Cerros, an ancient fort.

No. 40. Prehistoric skull from San Damian, Peru. Female. Remains of ancient incomplete trephining, by abrasion, on the left parietal.

No. 87. Prehistoric skull from Cinco Cerros, Peru. Male. Old circular scar in the right fronto-parietal region: possibly trepanation.

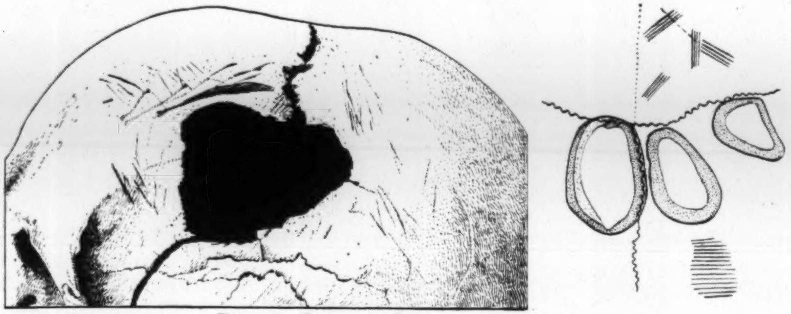

Fig. 16. (See also Fig. 14 a, b, c, d, e.)

These 2 Pictures Show an Arrangement of Striae, around the Trephined Opening, in Groups. On the Left is Skull No. 312, from Peru, Showing 5 Groups of Striae. On the Right is Baudouin's Picture of a Trephined Skull from a Neolithic Ossuary at Vendrest, France, Showing Similar, but More Definite, Groupings of Striae. I am Totally at a Loss to Explain This Condition. The Comparison is Interesting, but Remains a Puzzle.

No. 98. Part of prehistoric skull from Nasca Region, Peru. Surface scar, possibly of traumatic origin: may be due to surgical abrasion of the surface.

No. 113. Prehistoric skull from Cinco Cerros, Peru. Male. Large old depressed scar over the frontal, with two smaller ones on the left parietal. One of the latter possibly representing trephining.

No. 121. Prehistoric skull from near St. Lucia, Peru. Male. Aymara deformation. Remains of what was evidently an incomplete trephining, anterior third of sagittal suture.

No. 130. Part of prehistoric skull from Nasca Region, Peru. Extensive old injury in the right parietal with a fracture running down to zygoma. Possibly trepanation about upper part of wound. Female.

No. 229. Prehistoric skull from Cinco Cerros, Peru. Female. Old scar over the left part of the frontal, possibly trepanation besides injury.

No. 241. Part of prehistoric skull from San Damian, Peru. Female. Old large healed scar over the frontal, possibly trephining.

No. 243. Part of prehistoric skull from Lomas, Peru. This specimen shows a cleanly cut beveled edge with some signs of healing, and is doubtless a piece of a skull that was trephined.

No. 244. Part of prehistoric skull from San Damian, Peru. Old trephining of the frontal directly above nose and right orbit. Healing with signs of inflammation.

No. 250. Part of prehistoric skull from San Damian, Peru. Female. Old healed injury with possibly a trephining in the frontal.

No. 254. Prehistoric skull from Cinco Cerros, Peru. Male, Ancient injury above both orbits, followed by trepanation, with advanced healing. Another small trepanation seemingly attempted at bregma.

No. 255. Prehistoric skull from Lupo, Peru. Female. Injury with extensive surface inflammation in the posterior part of the left parietal and adjacent portion of the occipital, followed by multiple trephining, through cutting and scraping. Some signs of healing after the operation.

No. 256. Prehistoric skull from Nasca Region, Peru. Male. Large scar on the posterior part of the right parietal, which, judging from its quadrilateral outline, is probably the remains of a trephining. Depressed scar on the left parietal.

No. 257. Prehistoric skull from Cinco Cerros, Peru. Female. Signs of injury with subsequent large trephining. by straight and curved cutting, in the right parietal. Slight signs of healing.

No. 258. Prehistoric skull from Cinco Cerros, Peru. Double ancient trephining, one in frontal and one in right parietal. Both show considerable restitution of bone.

No. 259. Prehistoric skull from Cinco Cerros, Peru. Ancient trephining, possibly by scraping. Trace of an old fracture.

No. 260. Prehistoric skull from San Damian, Peru. Male. Ancient trephining in the right parietal, with considerable restitution of bone. A scar, possibly after trepanation, on the frontal.

No. 261. Prehistoric skull from Cinco Cerros, Peru. Male. Signs of injury (open coronal suture) in the right parietal with subsequent trepanation by clean cutting. Only slight healing.

No. 262. Prehistoric skull from Cinco Cerros, Peru. Signs of old injury, followed by extensive trepanation and considerable restitution of bone. Rare specimen.

No. 264. Prehistoric skull from Cinco Cerros, Peru. Ancient trephining with considerable restitution of bone on the right side in frontal.

No. 265. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trepanation in frontal with considerable restitution of bone.

No. 268. Prehistoric skull from Cinco Cerros, Peru. Female. Ancient trephining in the posterior part of the right parietal, with considerable restitution of bone.

No. 269. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining in the right parietal, advanced healing.

No. 270. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining in the upper portion of the occipital, with large restitution of bone.

No. 271. Prehistoric skull from Cinco Cerros, Peru. Male. Double trepanation, one in frontal, one in parietal, by cutting, followed injury on the top of the head. Little if any healing.

No. 272. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining in the right parietal, with considerable restitution of bone.

No. 273. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trepanation in the frontal, with considerable restitution of bone.

No. 274. Prehistoric skull from Cinco Cerros, Peru. Female. Ancient trepanation in the posterior part of the left parietal, with considerable restitution of bone.

No. 275. Prehistoric skull from Cinco Cerros, Peru. Female. Signs of ancient injury in the right parietal, with subsequent trepanation and advanced healing.

No. 276. Prehistoric skull from San Damian, Peru. Male. Extensive old injuries of the right side of the face: also a perforating scar in the left temple.

No. 277. Prehistoric skull from Cinco Cerros, Peru. Female. Double, large trephining in the posterior half of the left parietal. No signs of healing.

No. 278. Prehistoric skull from Cinco Cerros, Peru. Female. Injury on the right parietal, followed by trepanation. Little if any healing.

No. 279. Prehistoric skull from Cinco Cerros, Peru. Male. Trephining, by the cutting method, in the middle of the frontal: signs of preexisting injury. Old extensive injury of the right orbit.

No. 280. Prehistoric skull from Cinco Cerros, Peru. Adolescent female. Signs of old injury in the left parietal, with subsequent trepanation and considerable healing.

No. 281. Prehistoric skull from Cinco Cerros, Peru. Male. Large ancient trephining in the left parietal; advanced healing.

No. 282. Prehistoric skull from Cinco Cerros, Peru. Male. Old injury with inflammation on the left parietal and occipital, with subsequent trephining.

No. 283. Prehistoric skull from Matucana, Peru. Female. Fracture of the vault, following in part the coronal suture. Attempted trephining by the very rare method of drilling. Very valuable specimen.

No. 284. Prehistoric skull from Huarochiri, Peru. Male. Injury to the vault with radiating fractures followed by a double trepanation, one in each parietal, partly by cutting and partly by scraping. Some healing noticeable. Valuable specimen.

No. 285. Prehistoric skull from Cinco Cerros, Peru. Male. Perforation in the right part of the frontal: probably an old, largely healed wound, though possibly on old trephining.

No. 286. Prehistoric skull from Cinco Cerros, Peru. Male. Signs of extensive ancient injury, followed by trepanation and considerable restitution of bone.

No. 287. Prehistoric skull from Cinco Cerros, Peru. Female. Single or double ancient trepanation on top of skull, with considerable restitution of bone.

No. 288. Prehistoric skull from Cinco Cerros, Peru. Male. Trephining in the frontal, penetrating the left frontal sinus, made by cutting, leaving beveled edges: some healing.

No. 289. Prehistoric skull from Cinco Cerros, Peru. Ancient trephining in the right parietal, with considerable restitution of bone. Large scar in the middle of the frontal, possibly also after trephining.

No. 292. Prehistoric skull from Cinco Cerros, Peru. Female. Ancient trepanation in posterior part of left parietal, extending to the occipital, with considerable restitution of bone.

No. 293. Prehistoric skull from Cinco Cerros, Peru. Ancient trephining in the back of the skull with considerable restitution of bone.

No. 294. Prehistoric skull from Cinco Cerros. Peru. Trephining by cutting or sawing in the right part of frontal. No healing. Scarified patch somewhat more medially.

No. 295. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining with considerable restitution of bone above middle of frontal. Old healed injury to the lower medial part of left orbit.

No. 296. Prehistoric skull from Nasca Region, Peru. Male. Large, healed, perforating injury (trephining?) in the posterior part of the right parietal. Old injury of the right maxilla.

No. 298. Prehistoric skull from Cinco Cerros, Peru. Male. Double trepanation, one in each parietal, followed by considerable restitution of bone.

No. 299. Prehistoric skull from Cinco Cerros, Peru. Male. Injury with subsequent trephining, not completed, in the occipital. Extensive ancient injury on the left side of the face.

No. 300. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trepanation in posterior portion of left parietal with considerable restitution of bone.

No. 302. Prehistoric skull from Cinco Cerros, Peru. Ancient trephining in the posterior part of the right occipital, with considerable restitution of bone.

No. 303. Prehistoric skull from Cinco Cerros, Peru. Male. Injury with trephining in frontal: healing, showing signs of inflammation.

No. 304. Prehistoric skull from Cinco Cerros, Peru. Female. Old injury with signs of inflammation in left parietal, followed by partial trepanation.

No. 305. Prehistoric skull from San Damian, Peru. Trepanation in posterior part of right parietal: beveled edges: fairly advanced healing. Supernumerary tooth.

No. 306. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining, possibly double, in the back of the skull.

No. 308. Prehistoric skull from San Damian, Peru. Female. Trepanation by multiple clean cutting over bregma: slight healing only.

No. 309. Prehistoric skull from Cinco Cerros, Peru. Male. Multiple operation by cutting, following an injury, in the right half of the frontal. Indications of the survival of the patient for some time.

No. 310. Male, prehistoric skull from Cinco Cerros, Peru. Shows old scar and other signs of injury on left parietal and three openings on left side, all of which are probably the remains of trephinings. Rare specimen.

No. 311. Prehistoric skull from Cinco Cerros, Peru. Probably male. Double trephining, by cutting, in frontal and right parietal, following an injury and inflammatory process in the bone.

No. 312. Prehistoric skull from Cinco Cerros, Peru. Female. Injury of the frontal and left parietal, followed by partial trepanation and doubtless removal of fragments of broken bone. Two old scars due to injury on the left parietal.

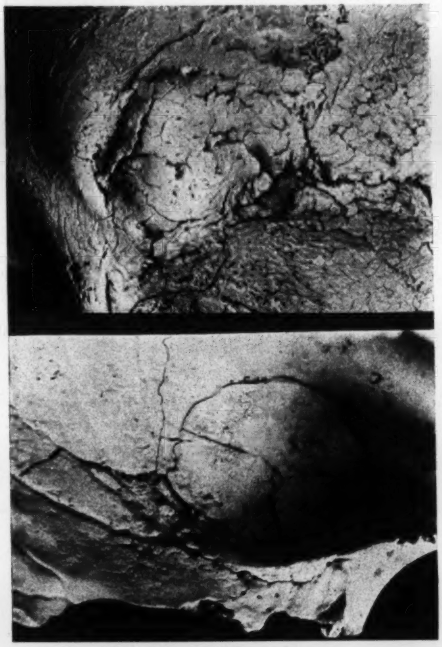

Fig. 17. Evidence of Bone Transplant by a Pre-Columbian Surgeon in Peru. Upper Figure Shows Outer Surface of the Lesion, and Lower Figure Inner Surface of What I Regard as a Possible Bone Transplant. I Cannot Account for the Details of the Area in Any Other Way. In the Lower Figure the Line Running to the Left is a Fracture. About Natural Size. Skull No. 55 Female, from Coyungo Near Nasca.

No. 313. Prehistoric skull from Cinco Cerros, Peru. Trephining by cutting and sawing in posterior part of right parietal: slight, if any, healing. Old healed injury in middle of supra-orbital region.

No. 314. Prehistoric skull from Cinco Cerros, Peru. Female. Large trephining by multiple cutting or sawing in the frontal. Traces of preexisting fractures. No healing.

No. 315. Prehistoric skull from Cinco Cerros, Peru. Female. Large trepanation in left parietal, with considerable restitution of bone.

No. 659. Prehistoric skull from Cinco Cerros, Peru. Male. Trepanation by cutting in posterior part of left parietal. Little if any healing.

No. 749. Prehistoric skull from Cinco Cerros, Peru. Male. Ancient trephining, followed by considerable restitution of bone, in the frontal. Another old trephining probably in left parietal. A number of perforating lesions in different parts of vault. Some destructive process of face.

BONE TRANSPLANT

It would seem incredible, in view of the crass ignorance of the ancient Peruvians on some matters, to expect them to appreciate the significance of a bone transplant. Such a procedure is, however, practiced by the Algerians, and Hilton-Simpson (Ref. 16, p. 11) says that bone is substituted in limb bones where there has been a gap due either to injury or surgery. "The substitution of animal bone for bone damaged by gunshot wounds in other parts of the body is by no means rare, and has been successfully performed by several of the native practitioners I have met."

With this in mind I have searched eagerly for evidence that the ancient Peruvian surgeons replaced the trephined plaques or substituted other bone for them. Such an explanation fits the condition found in skull No. 55 of the San Diego Museum, shown in Figures 17 and 18. The catalogue data are:

No. 55. Prehistoric skull (incomplete) from Coyungo near Nasca, Peru. Remarkable extensive and healed injuries on both sides of the frontal, as well as in both parietals. Female.

The injuries to the parietal are quite superficial and confined entirely to the outer skull table (Fig. 18). The skull is badly weathered so that the external characters of the remarkable injury to the left frontal are not particularly obvious. An examination of the interior of the skull reveals a most interesting condition. It would seem from all evidences that the lesion is really a healed depressed fracture (Fig. 17), but it also looks as if a prehistoric surgeon had attempted a bone transplant and had succeeded. From this lesion, about 40 mm. in diameter, there runs posteriorly for a distance of 50 mm. a large fracture line, which is obvious externally near the left parietal eminence. The inner skull table at the asterion had become badly infected and there is an eroded area 20 by 30 mm. extending backward onto the parietal along the fracture line. On the opposite side of the frontal there is another injury the external appearance of which curiously resembles a figure 5. Internally it presents the characters of a healed depressed fracture. The weapon which made the wound is uncertain.

This indication of operative surgery in the ancient skull can be regarded as only suggestive, since the facts involved are uncertain. The matter is placed here for future study since the known evidence is all too uncertain to draw safe conclusions.

AMPUTATIONS

There is no osteologic evidence of amputations in pre-Columbian Peru. All we know about the matter is based on the ancient pottery figure,[4] shown holding a cap ready to adjust it to an amputated stump. Muniz thought the ancient Peruvians capable of performing this operation, but gives no evidence.

BANDAGING

I have already given[5] all the known details of this surgical art, as seen in the single example.

No. 658. Prehistoric, male, skull from Lomas, Peru. Skull surrounded by ancient bandage, applied in all probability for either surgical or other curative purpose. Unique specimen.

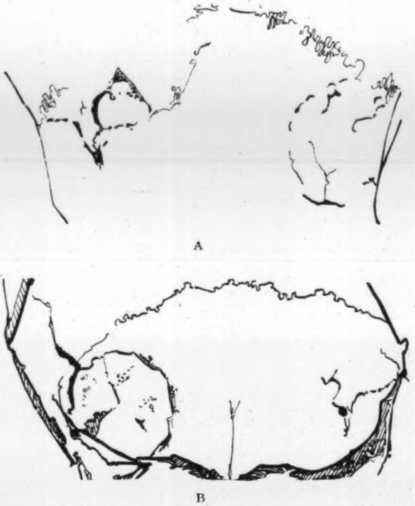

FIG. 18. DRAWINGS OF THE LESIONS IN THE FEMALE SKULL NO. 55, SHOWING ABOVE THE EXTERIOR OF THE 2 LESIONS, THE ONE ON THE RIGHT BEING THE SUPPOSED BONE TRANSPLANT. LOWER. INTERIOR ASPECTS OF THE 2 LESIONS; THE SUPPOSED TRANSPLANT BEING ON THE LEFT.

SURGICAL INSTRUMENTS

I have shown in Figures 2 and 3, a number of stone knives, saws, scrapers and drills which may have served the purpose of the archaic surgeon. Escomel thinks that some of the fairly perfect bronze knives may also have been used. We know nothing definite about the matter at the present time, other than has already been detailed.[4] Freeman[13] has written an interesting account of primitive surgical instruments, but has added nothing essentially new. McGee[8] writes a fine account of the instruments used in trephining, basing his ideas on the scratches and marks accompanying the trephining, as well as the trephined opening itself (Fig. 16). I have discussed and figured[4] stone and bronze instruments, doubtless useful to the pre-Columbian surgeon. Freeman and Escomel have commented on my suggestions.

CAUTERIZATION

Nothing new concerning the use of the actual cautery in pre-Columbian Peru has been determined since I detailed the evidence[4] of this practice. A single ancient Peruvian skull, preserved in the American Museum of Natural History, (Ref. 4, Fig. 49) reveals the evidence of this procedure. A reconstruction of a primitive surgical operation forms the frontispiece of my "Paleopathology." The details are given in sufficient completeness[18] elsewhere, so that further discussion is not warranted here.

OTOLOGY, RHINOLOGY, LARYNGOLOGY

My purpose in referring to these specialties is not to discuss the ancient operations, for these are unknown, but to give some indication of pathology which might have induced surgical interference. Burton[6] has written a very interesting and suggestive account of these matters.

Otosclerosis existed in ancient Peru, associated with certain aural exostoses in the form of ivory-like osteomata in the external acoustic meatus. Disturbances to the mastoid are known, and remain to be studied.

Burton[6] remarks: "Prehistoric rhinologic pathology is a subject upon which, as far as I know, there is practically no literature, and I seem therefore to be in the position of offering the initial tribute to this branch of scientific lore . . . " He finds as a basis of his discussion the following factors which might have brought about the development of rhinologic surgery. (a) Frontal involvement. The evidence that the pre-Columbian surgeon was interested in the nose is given here in Figures 4 c, d; 9 a, b, c. (b) Nasal fracture. Six instances of this are shown in the collection. Examples are shown in "Studies in Paleopathology, xxi." (c) Compensatory middle turbinate hypertrophy. (d) Hypertrophy independent of septal deviation. (e) Displacement of choanae. (f) Nasal fistulae.

These phases all need to be thoroughly revised and studied in large collections.

EXCISIONS

A prehistoric skull, no. 86, San Diego Museum, from Chavina, Peru, shows extensive lesions of the right and partly, also, of the left maxilla, with perforations into the maxillary sinus. This is shown in Figure 15, a, b. These extensive lesions are thought to be due to an ulcerative disease called *uta*, a phase of Leishmaniasis. The prevalence of this infection in prehistoric Peru is shown by its frequent appearance on the potteries of the pre-Columbian people. Numerous examples of it are known, and I have discussed the major facts[4] of its representation. This disease usually attacks only the softer tissues and cartilage. Rarely does it affect the skeleton. Some of the ancient potteries indicate that the prehistoric surgeon amputated the diseased parts of the face, in the hope of ending the further spread of this loathsome malady.

Because of its nature the effects of uta are seldom seen in the bones, and on that account Skull No. 86 is the more interesting because of its rarity. The lesions may fairly be referred to the ravages of uta. The appearance of the skull in Figure 15 suggests that a surgeon had amputated the diseased parts of the face, leaving a fairly smooth clean-cut surface of well-healed bone. This example may be fairly regarded as the result of a successful prehistoric surgical operation.

Another type of excision is shown in a seated pottery figure, from the soles of whose feet the prehistoric surgeon had excised certain parasites.

DENTISTRY

The teeth, palate, and jaws of the pre-Columbian Peruvians show a high prevalence of disease. No study of even the normal dentition has ever been published, although such a study has been made at the University of California, Under the title "Prehistoric Stomatology," I am collecting the details of the evidences of disease of the oral region among the ancient Peruvians. A great many of the skulls collected show that edentulous palates and alveolar osteitis were common. Observations on roentgen-rays of the mummies reveal conditions which indicate that many of these people had lost a greater part of their teeth before they attained the age of forty years.

In spite of the impelling factor, disease of the teeth, the ancient Peruvians had no knowledge of operative dentistry at all. Even the simplest curative effort, that of extraction, seems never to have been thought of by them. Surgery of the mouth was unknown and unthought of.

OPHTHALMOLOGY

The eyes of the ancient dwellers of the Peruvian highlands must have given them great distress since their fuel was chiefly the smoke-producing dried dung of animals, and the absence of flues prevented the escape of the smoke, which must have filled their dwellings almost continually. Possibly the ancient Peruvians, like other primitive races, knew how to remove the conjunctival pterygia to prevent their growth over the pupil. If the pre-Columbian Peruvians had such knowledge it remains to be revealed.

EMBALMING AND MUMMIFICATION

In view of the very great importance which has been shown[3] to have characterized embalming and subsequent mummification in ancient Egypt, where these practices had a daily import to all of the people for thousands of years, I am giving here what little is known, or rather conjectured, concerning these matters in pre-Columbian Peru.

It is told by such chroniclers of the daily life of the pre-Columbian Peruvians as Garcilasso de la Vega,[17] the son of an Inca princess and a Spanish father, that it was the custom among the ancients to bring out, on feast days, the mummified bodies of their relatives to seat these gruesome relics at table with them. This reported custom has given rise to much speculation as to the mode of preparation or embalming of the dead in ancient Peru. No systematic study of this matter has ever been made and there are no details of their procedure known, or whether, other than sun-drying, they took any pains with the mummification of the dead.

MacCurdy (Ref. 2, p. 246) says, "The Incas were on occasions successful embalmers of their dead." He refers to a work by Reutter[20] who is said to have analyzed embalming substances from Peru. These were found to contain menthol, salt, tannin, alkaloids, saponines and undetermined resins. MacCurdy suggests that some of these antiseptics may have been used by the prehistoric surgeons. Nothing further is known about the matter at the present time.

Garsilasso de la Vega,[17] and perhaps other contemporary writers, undoubtedly originated the idea that the ancient Peruvians embalmed their dead, with all that that custom implies. Vega says (Ref. 17, II, 91) that he saw the body of the Inca Uira-Cocha in 1570. Further on he remarks:

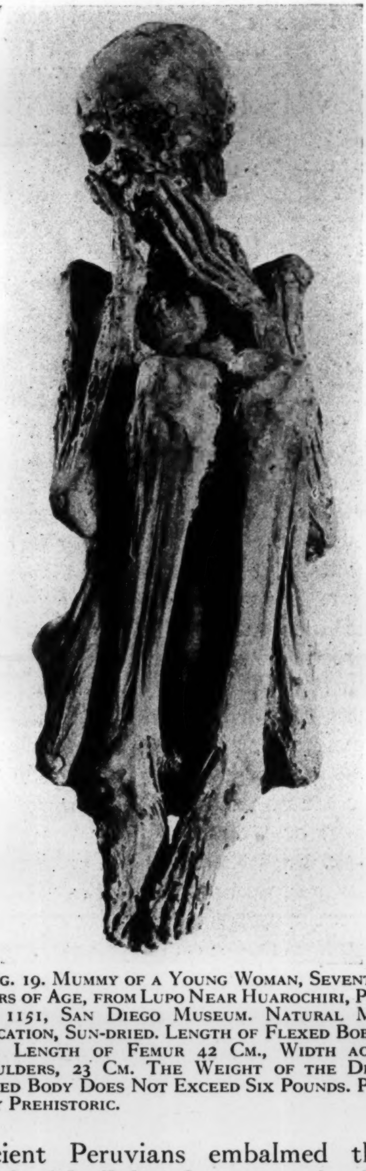

FIG. 19. MUMMY OF A YOUNG WOMAN, SEVENTEEN YEARS OF AGE, FROM LUPO NEAR HUAROCHIRI, PERU. NO. 1151, SAN DIEGO MUSEUM. NATURAL MUMMIFICATION, SUN-DRIED. LENGTH OF FLEXED BOBY 82 CM., LENGTH OF FEMUR 42 CM., WIDTH ACROSS SHOULDERS, 23 CM. THE WEIGHT OF THE DRIED, NAKED BODY DOES NOT EXCEED SIX POUNDS. PROBABLY PREHISTORIC.

> I confess my carelessness in not having examined the bodies more closely. I did not then think of writing this history, or I should have looked at them (i.e. the royal mummies) with more care, and ascertained how they were embalmed . . . Nor did I see the bitumen, for the bodies were so complete that they looked as if they were alive . . . For my part, I believe that the principal art in embalming was to take the bodies up to near the snow-line, and keep them there till the flesh was perfectly dry, and that afterwards they applied the bitumen . . . to fill up and supply the place of the flesh that had withered.

There is a great deal more of interesting conjecture by this Spanish-Indian writer, but his statements have no scientific value whatever, since he confesses that he did not know how the bodies were embalmed. So far as I can learn no one has furnished any evidence to support the assertions made regarding embalming. This is a field for future research.

Garcilasso de la Vega's credibility, however, is interestingly shown by his statement that: "They had not invented scissors nor metal needles, but used long thorns, and consequently they did not sew much." (Ref. 17, I, p. 203.) The nature of the needles is confirmed by the discovery at Machu Picchu[10] of very fair thorn needles, with eyes, as recorded by Eaton. There are in the American Museum of Natural History, No. B, 1956, large copper prehistoric needles with eyes for thread.

A footnote by Markham to his translation of "The Travels of Pedro de Cieza de Leon," page 226, is worth quoting, in part, in this connection, as showing how widespread was the impression that the ancient Peruvians embalmed their dead; but he fails to give any definite data to support the statements regarding embalming:

The obsequies of the Yncas at Cuzco were celebrated with great pomp. The bodies were embalmed with such extraordinary skill that they appeared to be alive, and were seated on thrones within the great temple of the Sun. The bowels were deposited in golden vases, and preserved in a temple at Tampu (twelve miles from the capital). . . These bodies were so well preserved that all the hair, eyebrows and even eyelashes remained intact . . . None of the thousands of bodies that have been examined, show any signs of having been embalmed. It seems clear that this operation was only resorted to in the case of the Yncas themselves.

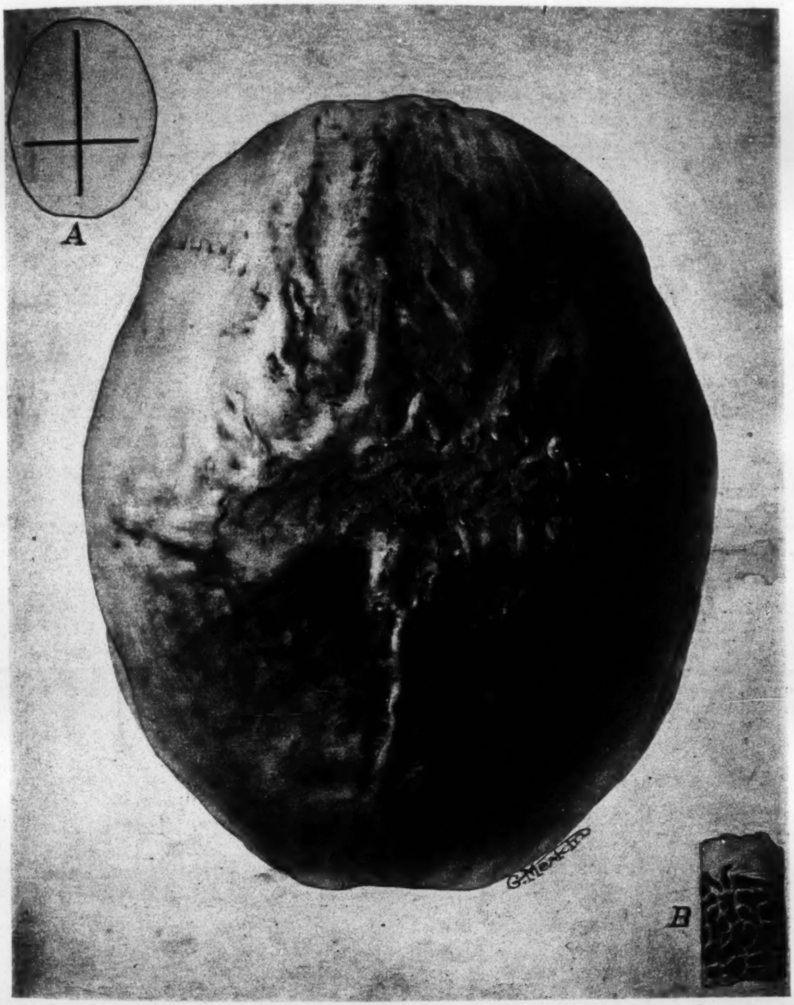

Fig. 20. Lesions of the Vertex of a Female Skull from Amazonas, Peru, Due to Cauterization of the Scalp Possibly to Counteract Melancholia. This is the Only Example of Cauterization from Pre-Columbian Peru. a: A Variant of the Sincipital T, Showing Shape of Incisions in Scalp. B: Section of Thickened Vault Showing Hypertrophy of Diploic Spaces, and Osteosclerosis of Cortex. Skull in the American Museum of Natural History.

Markham cites as his authorities Garcilasso de la Vega, Rivero and his own observations. I have been unable to find out who examined the "thousands of bodies," or where and how it was done. It may be that many of these early observers imputed to the ancient Peruvians customs which were known in other ancient countries, and did not examine carefully to determine if the customs really existed in Peru. The entire question of embalming in pre-Columbian Peru, with all its attendant culture features, is a problem open for investigation, in order to determine what part this custom played in the ancient civilization of Peru.

Obstetrics

Apparently there existed in ancient Peru no knowledge of the science of obstetrics. There is no evidence to show they made any attempt to aid childbirth. Garcilasso de la Vega (Ref. 17, 1, p. 317), says: "They gave birth without the aid of a midwife, and if such a person was ever used, she was more a sorceress than a midwife. This was the usual custom of the Indian women in Peru, in bearing and nursing children, without distinction between rich and poor, high and low." The prevalence of infant mummies, premature and postpartum, would indicate a high infant mortality. All of the infant mummies I have seen were prepared by drying. The umbilical cord was left long and kept when dried, to quiet the restless child, by giving it the dry tissue to chew.

Medicine and Phlebotomy

Our knowledge of the pre-Columbian use of medicines in Peru has never been summarized, and only a few facts are known. The use of the leaves of the coca plant has been frequently discussed, and the effects of the cocaine upon the body is well known. The entire subject is in need of closer study by a competent student. One of the most striking things about writings the of Garcilasso de la Vega (Ref. 17, 1, chap. xxiv) is the entire absence of any statements regarding trephining. He says: "When they felt a bad pain in the head, they bled between the eyebrows, just above the nose." The infrequent occurrence of trephined skulls near Cuzco, where Vega lived, may account for his neglect. His discussion of phlebotomy is summarized by Freeman[13] who also figures a flint lancet with its wooden haft and handle of wool. Garcilasso de la Vega gives a very exact description of this instrument, and it is interesting to know that such an object exists.

Conclusions

The introductory paragraph of Professor Todd's address before the American Historical Association[19] is so apt to my purpose in preparing the present paper that I quote it substituting the word Peruvians, where Todd used Egyptians.

> There is no people whose doings and whose thoughts are more fascinating to investigators of today than the ancient Peruvians, and modern writers, in their boundless enthusiasm, have ascribed to them thoughts and interpretations, even scientific practices, far beyond their deserts. The human race is not singularly inventive or piercingly discriminative by nature and the Peruvians in spite of their wonderful civilization were no exception to this rule. Before we accept the advanced views on hygiene and contagion, the skill in surgery and great development of medicine with which this people

is credited, it is incumbent on us to examine the evidence with the greatest care.

This paragraph gives my guiding policy in making my studies on the Paleopathology of Peru. I have accepted nothing that has as its foundation speculation and report. The status of the ancient Peruvians' practice of *embalming* reveals clearly that this attitude is correct. *The ancient Peruvians may have embalmed their dead, but so far as I know at present, they did not open the abdomen for any purpose whatsoever*. The matter thus stands, as all research problems should, open to investigation.

Trephining or trepanation may have been a military measure, following injuries received in battle. The great majority of trephined skulls discussed here were derived from the locality, Cinco Cerros, supposed to have been an ancient fort. Many of the trephined skulls were females who evidently took a part in battle, as suggested by a study of head injuries. Many of the trephinings studied show parts of fractures, showing that depressed fractures were a frequent cause of trephining.

The use of living bone to stop a trephine opening is suggested by a single specimen. No plates of gourds, cocoanuts, or silver or other metal were used to stop the trephine wound so far as can be ascertained. Thin silver plates were, however, used as personal decorations, on the cheeks.

A single female skull reveals all we know at present about cauterization in pre-Columbian Peru.

Amputations were probably performed, but osteologic evidence is lacking.

Bandaging is indicated in a single mummified head.

Surgical instruments of stone, and possibly copper and bronze, are known. They were adapted from other uses, and it is not supposed that the prehistoric surgeon had any special instruments.

Luxations and fractures may have been reduced and fixed but there is no definite evidence on these subjects since the pathological limb bones have not been studied.

The specialties otology, rhinology and laryngology are suggested as having been thought of by the ancient Peruvians.

A single example shows a clean-cut excision, and many others are indicated by the pre-Columbian potteries.

Ophthalmology may have been slightly understood.

Embalming may have been practiced, but the details are not known. Abdominal incisions are unknown.

Mummification was practiced by drying.

Obstetrics was unknown.

Medicine and phlebotomy were practiced to some extent.

It will be clear to careful readers of this review of "Surgery in pre-Columbian Peru" that our knowledge of the subject is in a very unsatisfactory state. The subject of trephining, the most elaborate method of surgery known, is very poorly understood. The entire subject, with its many ramifications, needs to be restudied from thousands of specimens. Dr. Julio C. Tello is gathering for the Museo de Arquelogia peruana, at Lima, Peru, a collection as will do service for such a study. Dr. Tello writes that he is greatly interested in such a study and we hope he may make one as the subject justifies.

Many other scientific branches of surgery are indicated by single examples, or suggested by prehistoric potteries. Much more direct evidence is needed. Bone transplant is suggested by a single example, as are also cauterization, bandaging, and excisions. Some phases are merely suggested.

This paper which I have written merely opens the field.

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[From Schenckius: Observationum Medicarum, Francofurti, 1609.]

EDITORIALS

PROCEEDINGS OF THE FIFTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE, MAY 6, 1929

By E. B. KRUMBHAAR, SECRETARY

PHILADELPHIA, PA.

THE fifth annual meeting of the American Association of the History of Medicine was held at the Hotel Traymore, Atlantic City, Monday, May 6 at 8.15 P.M. with the President, Dr. William H. Welch in the chair.

The preceding dinner was attended by thirty-seven members and guests, including Drs. C. C. Bass, George Brown, C. N. B. Camac, Cutler, Irving Cutter, F. R. Dieuaide, W. C. Davison, C. A. Elliott, F. H. Finlay, J. C. Hemmeter, Mr. Paul B. Hoeber, Drs. J. Kaufman, C. S. Kilgore, Oskar Klotz, E. B. Krumbhaar, E. Libman, W. T. Longcope, David Marine, S. L. McCalla, W. G. MacCallum, C. S. Martin, J. C. Mettier, Joseph L. Miller, W. S. Miller, George Minot, B. S. Oppenheimer, Francis Rackemann, Walter R. Steiner, D. C. Sutton, A. S. Warthin, William H. Welch, Carl V. Weller, George Whipple, Lucius Zeuch, L. G. Rowntree, J. C. Meakins and a few more who came in for the scientific program.

On motion from the floor the minutes of the previous meeting were accepted without being read. The report of the Secretary-Treasurer (herewith appended) was accepted for filing.

The following officers were elected for the ensuing year: President, Col. Fielding H. Garrison; Vice-President, Dr. A. S. Warthin; Secretary-Treasurer, Edward B. Krumbhaar. Council (two members): Dr. W. S. Miller to replace Dr. Joseph Sailer, deceased, and Dr. William H. Welch, incoming member.[1]

Doctor Welch spoke of the temporary reasons for having two official journals for the International Association (*Aesculape* and *Janus*) and it was the concensus of the meeting that the present arrangement of subscription to the journals be continued for another year.

In discussing the nature of the next meeting, it was suggested by Doctor Welch that the recommendation be made to the incoming President that in addition to the customary dinner and papers to be held at the customary time and place, a scientific session might be held on the afternoon of the same day, and the secretary was instructed so to inform Colonel Garrison.

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[1] The other members of the Council are Drs. Riesman, Webb and Hemmeter.

It was the concensus of opinion of the society that the Proceedings be published in the ANNALS OF MEDICAL HISTORY, if its Editor is willing.

Doctor Hemmeter presented the following items of medicohistorical importance which were connected with anniversaries of this meeting date:

Alexander von Humboldt, naturalist, demonstrates the existence of electrical currents in stimulated nerve and muscle fiber (1797–1799), thereby contributing to the solution of the polemic between Volta and Galvani. Founder of plant geography and comparative climatology. Born in 1769, *died* May 6, 1859, ninety years old.

Sir James Young Simpson, first to use chloroform narcosis in obstetrics. Inventor of acupressure, 1860. *Died* May 6, 1870.

Lavoisier, executed in Paris, May 7, 1794.

Justus von Liebig, renowned chemist *born* in Darmstadt, May 7, 1803.

Theodore Bilharz, known through his researches on parasites. *Died* May 7, 1872.

Thomas Young. Physicist, originator of the undulation theory of light; discoverer of astigmatism. Important work on the interpretation of hieroglyphics. *Died* May 10, 1829.

Giovanni Dominico Santorini, famous anatomist, *died* May 7, 1737.

Lazzaro Spallanzani, successively professor in Reggio-Modena and Pavia. Successfully opposed spontaneous generation. Performed classical experiments on the physiology of digestion. (See frontispiece of this year's program.) *Born* 1729, died 1799.

The appended program was then carried out and the meeting adjourned at 11.25 P.M.:

PROGRAM

President Dr. William H. Welch in the Chair

7.00 P.M. Dinner: Hotel Traymore.
8.00 P.M. Annual Business Meeting.
8.30 P.M. Dr William Snow Miller: Thomas Willis—A Much Maligned Physician.[1]
8.50 P.M. Dr. Lucius H. Zeuch: Reconstruction of the History of Medical Practice in Illinois Preceding 1850.
9.15 P.M. Dr. Irving S. Cutter: The History of Puerperal Fever.[1]
9.40 P.M. Dr. William H. Welch: Institutes of the History of Medicine.
10.00 P.M. Adjournment.

RECONSTRUCTION OF THE MEDICAL HISTORY OF THE ILLINOIS COUNTRY (PRECEDING 1850)

By DR. LUCIUS H. ZEUCH

EARLY MEDICAL LEGISLATION AND ORGANIZATION

(*Abstract*)

As early as 1817 the Territorial Legislature of Illinois meeting at Kaskaskia, through the speaker of the House of Representatives, Dr. George Fisher, enacted a law to govern the practice of medicine. This ordained that candidates for license to practice medicine must appear before an organization to be formed by the regular physicians, to ascertain their fitness to practice. Another act, larger in scope, supplanted this act in 1819, which compelled doctors to look after medical matters. They were to pay a fine if they failed to attend meetings and if complaints that were made by patients relative to exorbitant charges for services were found well grounded, part of the fee was to be refunded. It also demanded that publicity be given to births and deaths in the transactions of the society. This law was obeyed by the physicians but pressure was brought to bear upon the legislators by charlatans which resulted in its repeal in 1821. A great inflow of irregulars followed this repeal, which created a demand by the public for another medical practice act. The small-minded men who composed the General Assembly at that time, under the guise of acceding to this popular demand introduced bills that were discarded with the result that their shortsightedness allowed men to use Thomsonian certificates purchasable for twenty dollars as permission to practice. This system of botanical medicine, worded "for family use," was constructed to mean that a cursory knowledge of its contents qualified the purchaser to treat the entire human family.

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[1] To appear in full in the ANNALS OF MEDICAL HISTORY.

Subsequent petitions for medical practice acts to resist the encroachments of these interlopers were disregarded by the legislators, who were influenced by those profiting by freedom from prosecution. Illustrative of the methods employed by the Solons in thwarting protection measures promulgated by physicians was the coup perpetrated by representative Logan, who moved to amend the bill by striking out all after the enacting clause and inserting the following: "That no physician, surgeon or lawyer shall hereafter be entitled to sue for, or recover by action of law, his or their fees for services rendered as such physician surgeon or lawyer." The report, bill and proposed amendment were laid on the table by 55 yeas and 50 nays.

The futility of getting legislative help against quacks led to the calling of a convention of physicians in Springfield in 1840, which resulted in an organization that "asked not legislation to sustain it." In a document of exalted aims it was stated "we place ourselves before the public on our merits, having a strong and abiding confidence in the wisdom of the people." A fee schedule was adopted at this meeting but the organization failed to function beyond 1847. In 1850 the Illinois State Medical Society was born, a virile organization which in 1925 celebrated its seventy-fifth anniversary by sponsoring the writing of the "History of Medical Practice in Illinois."

The history of other medical societies in the State was recounted in this research and its publication in full will appear elsewhere.[1]

INSTITUTES OF MEDICAL HISTORY

By DR. WILLIAM H. WELCH

(*Abstract**)

Of the number of existing institutes of medical history, the one at Leipzig is the only one really worthy of the name. There is, however, an unparalleled opportunity for medical history research at the Wellcome Museum in London if their acquisitions could perhaps be weeded out somewhat and especially made more available for study. For instance, a large collection of medical incunabula and other valuable volumes there are at the present moment totally unavailable for study.

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[1] *Bull. Soc. Med. Hist. Chicago.*

* This abstract has been seen but not corrected by Dr. Welch.

There is also a promising institute at Naples in connection with the Laboratory of Surgical Pathology.

The Leipzig Institute, inadequately housed in the lower floors of the Mineralogical Institute, was started by the Puschmann Stiftung with Doctor Sudhoff as its first director. It centers about an excellent reference library which has been built up on the principle of affording opportunities for research rather than the accumulation of medical rarities. The library covers related historical topics (*e.g.* mathematics, and other sciences), as it is impossible to separate the history of medicine from the other histories of the same period. *Mitgliederschaft* can be obtained on a payment of three marks; this includes a loan of keys to the building, which is open from 8 A.M. until 10 P.M. Each student is assigned a place and attends lectures and seminars as well as pursuing individual research. More emphasis is placed on the seminars than the lectures. These are given at stated periods but without any idea of covering the whole subject in a given semester. A different subject may be taken up, each semester; Doctor Sigerist, the present Director, being especially fond of Medieval history. *Doktorantzimmer* are provided for the use of those whose interest is perhaps less centered on the research side. Many Medical students of all kinds come in there to read, especially as medical books are now very scarce in Germany. Sudhoff still has quarters in the building and is again working at his monumental work on Paracelsus. Parenthetically it might be added that it is difficult for anyone outside of Germany to enter quite into the German feeling for Paracelsus. Sudhoff takes the point of view that no single medical historian can properly include in the field of his own studies the history of science after Galileo, as it then becomes too extensive and specialized. The Institute is now supported by the Saxon government, as the original foundation became entirely inadequate after the fall of the financial value of the mark. Both Sudhoff and Sigerist show a remarkable knowledge of the whereabouts of the important manuscripts and early medical books throughout Europe. For instance, the La Cava Monastery Library (nine miles from Salerno), only second in importance to that of Monte Cassino, when mentioned by me was found to be well known to the German authorities. Doctor Sigerist has just spent a number of months in Spain going over little-known monastery libraries in that country and has come to the conclusion that there is not much of importance in the libraries of Western Europe that is not already known. It has been pointed out that some of the productivity of the Leipzig Institute may be attributed to the demand of the German University from graduating students for dissertations, many of which are written on medico-historical subjects. There are several journals devoted to the subject published from the institute. For instance, the *Archiv für Geschichte der Medizin*, the *Studien*, *Beiträge* and the *Jahrbuch*. The *Mitteilungen* belongs to the Society of the History of Medicine of Germany.

It is rumored that Berlin is also about to start an Institute of Medical History. The Warburg Library at Hamburg is a very interesting place and properly considered one of the most active places in Germany for medical history research.

In regard to the Johns Hopkins Institute of Medical History the aim is to collect as good a working reference library as possible, though it is hoped that the rarities will also come along in time by gift. For instance, a Johannes de Ketham's "Fasciculus Medicinae" has just been donated, a very important book which has a list price of about $900. The Institute has gone deeply into photographic reproductions which will probably become increasingly more important in medical history research. A photostat is therefore a prime necessity. All the main libraries are equipped with this and will furnish photographic copy of a page at a small price, for instance for 4 francs in the Bibliothèque Nationale at Paris. The incumbent of a Department of the History of Medicine should both induct students into the history of medicine and should inculcate the historical method of approach. The aim of the department should be both the investigation of the history of medicine for the purpose of advancing the general knowledge of medicine and also to improve the general culture of the student. It corresponds somewhat to the earlier German term *Propädeutik*.

THE CALIFORNIA MEDICAL HISTORY SEMINAR

The California Medical History Seminar was organized January 30, 1929 with a display of rare books arranged by Dr. Herbert Evans and Dr. and Mrs. LeRoy Crummer. On April 1, 1929, Prof. C. D. Leake presented a paper on "Roman Architectural Hygiene." At the summer meeting Miss Sonoma Cooper presented a paper on "The Medical School of Montpellier in the Fourteenth Century."[1]

BIBLIOTHECA OSLERIANA

It is with mingled feelings of joy and sorrow that we turn the pages of the noble volume which contains the record of Osler's invaluable gift to McGill University. There is sorrow because its beloved Author did not live to complete the compilation of the work itself, and there is joy because his well-formulated plan for its completion has been carried out by those thoroughly competent for the task, chosen by him to carry it on, and so imbued with his spirit that they have accomplished it as he would have wished.

In 1911 Osler formulated the plan of the classification of his books and manuscripts which he thought would carry out the aim, which he publicly expressed in 1919:

> Faced with a bewildering variety and ever-increasing literature, how is the hard-pressed student to learn, first, the evolution of knowledge in any subject, and secondly, the life and work of the men who made the original contributions? So far as concerns Science and Medicine, an attempt is made to answer the question by the collection of a Bibliotheca Prima. . . . The idea is to have in a comparatively small number of works the essential literature grouped about men of the first rank, arranged in chronological order. . . . The fundamental contribution may be represented by a great Aldine edition, e.g. Aristotle, by the brief communication such as that of Darwin and Wallace in the *Proceedings of the Linnean Society*, 1858, or by a three-page pamphlet of Roentgen.

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[1] These papers will be published in a future issue of the ANNALS OF MEDICAL HISTORY.

The aim was novel, differing entirely from the ordinary arrangement of a library and necessarily involving some curious mixups in the placing of its contents. Thus, as the Editors point out, in order to complete the section on Harvey and the Discovery of the Circulation, we find Servetus transplanted from the sixteenth to the seventeenth century, along with Realdus Columbus and Caesalpinus, also forerunners of the great Englishman. When difficulties such as this were pointed out to Sir William he had a ready answer: "We'll print in large letters at the top of each page, *Consult The Index First*." This has not been done but the advice solves the problem. The admirable index, which must have been a great labor in itself, is sufficient guide to enable the searcher to find anything he may wish in the body of the catalogue. Such an arrangement is of necessity somewhat arbitrary, as is illustrated in the instance of Anaesthesia, where that is chosen as the heading rather than the name of any individual connected with it, possibly because of the bitter warfare waged over its discovery, or, as the Editors suggest, "because, in the case of Anaesthesia, the gift was so definitely greater than the unhappy giver." The arrangement throughout is due to Osler and surely no one was more competent for the task. At any rate no better guide and stimulus to the study of the great events and movements in medical history can be imagined than the Bibliotheca Prima as it stands. Starting with "The Beginning," which consists of books on anthropology, primitive medicine and folklore, it goes on through the "Ancient Civilizations," Egyptian, Babylonian, etc., to the Greeks and Latins, then to the Arabians. In the Middle Ages we find but one name, that of Roger Bacon. Then follow the subsequent centuries in chronological order, beginning with the sixteenth to the present, the last name of the sixty-seven leaders being that of Roentgen. We suppose there are some who might feel that some of the sixty-seven names might have been supplanted by others and that certain worthies have been omitted. For ourselves we are willing to abide by Osler's choice and have no suggestions to offer as to any changes. Biblotheca Secunda is more like the ordinary library catalogue, although but few libraries can boast such a list of choice works by the lesser lights of medicine.

Bibliotheca Litteraria is one of the choicest sections of the book, containing books of general literature which were written by doctors, or about doctors, or contain matter appertaining in any way to the medical profession. This section is particularly Oslerian, reflecting in the highest degree the mind and interests of its collector. Osler's notes on the various items are of especial interest. Bibliotheca Historica is a wonderful collection of not only the standard works on the history of medicine but rare monographs and tracts invaluable to the seeker after information on the subject and many of them now very difficult to obtain.

Bibliotheca Biographica contains not only biographies of physicians but reprints of biographical articles and autobiographies, matter which is generally buried in periodicals and transactions, whence it is to be dug out only with infinite pains.

Bibliotheca Bibliographica furnishes books on bibliography in all its aspects and is notable for its contents not only in connection with medical but with general bibliography. Many of the auction catalogues and booklists which it contains are quite unique.

The incunabula in the next section amount to over one hundred, many of them unique and all of real value and interest to the history of medicine. Lastly is a choice collection of manuscripts of various character a list of addenda, and a group of Oriental manuscripts and books, the latter presented to the Library in 1927 by Dr. Casey A. Wood. Many medical men have made large collections of books but none has shown the same wisdom and skill in their selection and certainly no one ever provided so generously and wisely for the continued usefulness of his collection to posterity. The catalogue bears the imprint of his high idealism on every page. The Editors have reproduced his annotations to the various items and they seem to be the echo of their writer's voice. Osler had written an Introduction which is prefixed to the book. In it he traces the origin of his interest in books, the beginnings of his career as a collector and the development of the plan of the Bibliotheca Osleriana. During his last illness his mind dwelt on his beloved books and up to the last he continued to write notes and memoranda about them. It is very touching to read the list he drew up of special items which he desired sent to several depositaries to which he felt they especially belonged. To Lady Osler belongs unstinted thanks for the zeal which she manifested in devoting herself to carrying out his wishes. The Editors, W. W. Francis, R. H. Hil and Archibald Malloch, have performed their arduous task with skill and love and we feel that the result would have fully satisfied Sir William's wishes.

The full title of this noble book is: "Bibliotheca Osleriana, a Catalogue, of books illustrating the History of Medicine and Science, collected, arranged, and annotated by Sir William Osler, Bt., and bequeathed to McGill University. At the Clarendon Press, Oxford, MCMXXIX." Osler's devotion to the work of the Clarendon Press is well known and we have the feeling that this book is a fitting tribute to his memory on the part of that body because of the notable way in which it has been produced.

FRANCIS R. PACKARD, M.D.

BOOK REVIEWS

A History of Pathology. By Esmond R. Long, ph.d., m.d., Professor of Pathology, University of Chicago. Balt., Williams & Wilkins Co., 1928.

In a pleasantly written foreword to this book Colonel Fielding H. Garrison recommends it "to any physician who wishes to know the origin and evolution of the basic discipline of scientific medicine," and the reviewer can heartily join in this commendation.

Beginning with an excellent résumé of the views on the nature of disease which prevailed in ancient times among the Egyptians, Sumerians and Jews, the story is continued through the Hippocratic period and the brief glory of the Alexandrian School to Galen, only to be obscured after that in the gloom of the dark ages, though Morgagni is credited with the statement that autopsies were performed at Byzantium in the sixth century in an effort to find out the cause of the plague.

One of the first records of a legal postmortem was of that performed on a nobleman who it was suspected had been poisoned, in 1302, by Bartholomeo da Varignana at Bologna. William of Salicet (*circa* 1201–1280) records a medicolegal autopsy in his "Summa Conservationum" (1275) and speaks as though it was not an uncommon practice.

The first book of the "Summa Conservationum" is, says Long, a "veritable special pathology, in which abnormalities of organs from the head to the feet are considered." William of Salicet correlated kidney disease with the onset of dropsy.

Throughout the fourteenth and fifteenth centuries dissections for teaching purposes steadily increased. In the latter half of the fifteenth century Antonio Benivieni of Florence kept careful records of a number of his cases, including autopsies on twenty of them. Those records were published in 1507, five years after their author's death, by the pious care of his brother. Benivieni was the first physician who is known to have asked surviving relatives for permission to open the body of the patient to find out the obscure cause of his death. Long quotes several of Benivieni's postmortem records. Alexander Benedetti, of Padua, a younger contemporary of Benivieni, also wrote a work containing many postmortem observations.

All the great Italian anatomists of the sixteenth century, Vesalius, Realdus Columbus, Fallopius, Eustachius, must be credited with pathological observations, but the first real pathologist in the modern sense of the term was the Frenchman, Jean Fernel (1497–1558). His work on pathology (1554) was the first book in which that subject was considered apart from other matter. He was the first systematic pathologist. Shortly after Felix Plater, Volcher Coiter, Marcello Donato, Dodoens, van Foreest, and von Grafenberg, all entered the field of pathology with notable contributions.

In the sixteenth century, William Harvey not only reconstructed the science of physiology, but made some notable contributions to pathology. Marco Aurelio Severino published the first textbook on surgical pathology in 1632, which was followed in 1641 later by Nicholas Tulp's "Observationes Medicae," which was, like Severino's book, accompanied by many excellent illustrations of pathological conditions.

One of the first to elucidate the pathology of cerebral hemorrhage was Johann Jakob Wepfer (1620–1695), who discerned the relation of cerebral hemorrhage to certain types of apoplexy, and discovered the predisposing aneurysms of the small vessels.

Dr. Long reproduces an interesting picture from the posthumous edition of Wepfer's works, showing the appearance of Wepfer's aorta at autopsy. The famous English anatomist, Thomas Willis, made notable contributions to pathological as well as to normal anatomy, and Frederick Ruysch, the Dutch anatomist, collected a notable museum of pathological anatomy of which he published atlases with copperplate illustrations of many of the most notable specimens.

The famous "Sepulchretum" of Bonetus, which was published in 1679 was an enormous collection of postmortem records compiled from literature, but not classified nor utilized to make general deductions. Modern pathology really begins with the publication in 1761 of Morgagni's great book "De Sedibus et Causis Morborum," with its correlation between clinical aspects and postmortem findings. Long considers his exposition of the lesions of the vascular system as Morgagni's outstanding contribution to pathology. He terms his work on aneurysms magnificent. The pathology of pneumonia was first thoroughly explained by Morgagni and we owe to him the introduction of the term "hepatization" of the lung.

One of the most interesting sections of Dr. Long's book is that which deals with the Paris school at the opening of the nineteenth century. We know of no better résumé of the work of that brilliant group which included Bichat, Laennec, Cruveilhier, and many more of lesser fame. In England the work of the Hunters and their nephew Matthew Baillie had greatly forwarded the science of pathology, and the Guy's Hospital group, Bright, Addison, Hodgkin, and a little later, Samuel Wilks, were worthy to succeed them. With the advent of Rokitansky, the great Vienna school came to the fore and maintained its preeminence in pathological anatomy down to the present day. Dr. Long calls Virchow "the greatest figure in the history of pathology" and gives a thoroughly adequate account of his work, which amply justifies his statement. He refers to the fact that Virchow could never overcome his hostility to the prophets of the next triumph in pathology, Pasteur, Koch, and those who established the new science of bacteriology. Long carries his story down through the work of Ehrlich.

It is with regret that one finishes the perusal of such an interesting work as this of Dr. Long, but it is also with the certainty that it will frequently be reopened. The numerous judiciously chosen illustrations add greatly to the text. Dr. Long's book can be heartily commended as a most valuable contribution to the history of medicine.

MEDICAL LEADERS FROM HIPPOCRATES TO OSLER. By Samuel W. Lambert, M.D., and George M. Goodwin, M.D. Illus. Indianapolis, Bobbs-Merrill Co., 1929.

There is frequent debate among those who lecture or write on the history of medicine as to the relative value of basing the story of the great advances and development of the healing art on the general advancement of the subject, considering it more as a part of the history of the development of civilization, or grouping the different phases of the subject about the figures of some great individuals who have made epochal contributions to the progress of medical science. Much can be said in favor of the latter standpoint and the authors of this book have certainly shown how it can be used to the best advantage. It is much more than a series of short biographies of great physicians and investigators. It is a continuous and consecutive history of medicine from Hippocrates to Osler, with great figures predominating each phase or era. Although the biographies are the hooks on which the story is hung they form a minor part of the narrative, in which the links are made up of excellent depictions of the movements caused by the men who are chosen as their chief promoters or originators. Many excellent histories of medicine are now available to the English and American student. For reference he has Garrison, and the translations of Baas, and a large part of Neuburger. The subject is presented in resumé in the excellent short histories of Withington, Singer, Dana and Selig. The work of Lambert and Goodwin is not a work of reference, the biographies not making any attempt at completeness, and there being also practically no bibliographic material, but it is a stimulating and delightfully told story of the development of medical science, evidently written *con amore*, and based on wide knowledge and familiarity with the subject. We regret the absence of an index.

FRANCIS R. PACKARD.

A HISTORY OF THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY. By P. M. Ashburn, Colonel, Medical Corps U. S. Army. With an Introduction by Surgeon General Merritte W. Ireland. N. Y., Houghton, Mifflin Co., 1929.

As librarian of the Surgeon General's office the Author of this timely book has had unusual opportunities to compile the data necessary for completeness and accuracy in a work of this character and while availing himself of them he has succeeded in condensing and arranging his material in such a way as to contain in one very readable volume a great mass of information of the greatest value not only to the medical historian but also to those who are interested in the military or any other phase of the history of the United States.

The book is divided into six parts, in chronological sequence. Beside dealing strictly with the history of the medical corps the Author gives a brief resumé in connection with each part of the history of the period and the condition of medicine and surgery at the time which is very helpful. Curiously enough the early history of the medical department of the army has been much more fully written of than that of the later years. J. M. Toner compiled a most useful record of the activities of the medical men of the Revolution and many others have written of the organization and history of the medical service in the Continental Army and the colonial militia. The First Part of Colonel Ashburn's book covers the history of the first hundred years of the medical corps from the first attempt at its organization under Dr. Benjamin Church down through the War of 1812, the Mexican and Civil War to the year 1873. Except for the official records of the Surgeon General's office the available printed matter on the medical history of the last three wars is singularly scanty. In the latter years of the Civil War the medical department made a splendid showing and yet its history is not generally known, very few of those who served in it having left any written record of their work. The Spanish American War was the chief event of interest in the Third Part of Colonel Ashburn's history. He shows that the terrible lessons of this brief contest were duly appreciated and brought forth good fruit in due time. His account is very impartial and lays the responsibility for the awful conditions which prevailed where it justly belongs. Following the Spanish American War those responsible for the conduct of the medical department bent all their efforts towards the prevention of a similar catastrophe, and when the United States entered the World War it was better prepared to meet the problems of the medical aspects of the struggle than even the most sanguine could have predicted. The various aspects of the work of the medical corps during the World War are excellently described and it is remarkable how large an amount of information the Author has managed to condense within the limited space at his disposal. The Medical Corps of the United States Army has reason to be proud of its wonderful record. It has numbered on its rolls many men who may justly be termed famous; John Morgan, William Beaumont, J. S. Billings, Gorgas and Reed, are foremost names in medical history aside from their excellent records as army surgeons. But it is not only these illustrious names that serve to blazon the glory of the medical corps. It is the unselfish devotion to duty and the high personal character of the great majority of its members, which has won them the confidence and esteem of the officers and men whose physical well-being is confided to them. The World War was the great test and the Medical Corps came through it not only unscathed but with added lustre. Colonel Ashburn has told the story, as General Ireland wished it, so that the people of the United States may learn something of the fine history of a body of men to whom it owes so much.

FRANCIS R. PACKARD, M.D.

OLD AGE, THE MAJOR INVOLUTION. THE PHYSIOLOGY AND PATHOLOGY OF THE AGING PROCESS. By Aldred Scott Warthin, PH.D., M.D., LL.D. 29 illus. N. Y., Paul B. Hoeber, Inc., 1929.

In this "De Senectute" Dr. Warthin shows that in addition to his well-known ability as a pathologist, he is also a good deal of a philosopher. The philosophy is influenced by his knowledge of pathology and so he gives us a study of old age from a fresh point of view. The essential point of his thesis is that old age should be regarded as a normal involution and not as a pathological process. That such a view would meet with universal acceptance is not to be expected when we consider the various ways in which life is regarded. The discussion is stimulating, however one regards old age, and should make every thinking person go carefully over his views on the subject. But is Dr. Warthin correct in saying that "We fear both age and death?" Does the average individual give much thought to them? Is it not one of the kindly provisions of life that age comes upon us in the majority of cases so gradually that there is no sudden shock? The fear of death, in the reviewer's experience, has been distinctly the exception. Sir William Osler was much interested in this question and for some years at the Johns Hopkins Hospital we collected observations with especial attention to the act of dying. It fell to me to study many of the patients who were hopelessly ill and to endeavor to get at their psychology. Naturally it was never said to a patient that death was inevitable. The impression gained was that with rare exceptions there is no fear of death. It may be said that these patients were too close to the change to care but when farther away my contention is that it is rarely considered. However, this is really not an essential part of Dr. Warthin's argument.

This holds that the normal duration of life is intrinsic and inherited and that old age is as much a normal biological period as that of growth and should not be regarded as a pathological process. Even during growth there are involution processes which begin with the fertilization of the ovum. In the development of the embryo involutionary processes are constantly at work and also after birth when vascular changes occur like those of the arteriosclerosis of later life but due to disuse and not to overuse. Growth and retrogression go together and are predetermined so that they are "intrinsic and inherited." This is good Presbyterian doctrine.

These may be regarded as the *minor involutions;* old age is the *major involution* and is the sum of organ and tissue involutions. With the tissue changes goes decline in the curve of function. Therefore it follows that old age is a normal involutionary process and to every one must come the time when he realizes that he faces the setting sun. It may be put otherwise by saying that it comes when for the first time one realizes that there is a horizon ahead as well as behind. How much effect this realization means to the individual must depend on his philosophy of life. A comforting fact, as Dr. Warthin points out, is that the cerebral functions have not finished their possibilities of growth at the beginning of physical senescence, so that mental and spirtual development may continue. The view that taking up golf is an early sign of senescence will not make Dr. Warthin popular in golfing circles.

This view of old age means that nature is concerned with the species more than with the individual and that when reproduction is accomplished the normal process is one of involution. The view of certain optimists (?) that the duration of life should be greatly prolonged and that more and more of us should reach advanced years receives no support here. What gain would there be in an increase in the number of the dependent aged either to themselves or to the race? There are exceptions, of course, but their rarity makes them all the more remarkable. Most of us would agree with Dr. Warthin that mere length of years is not to be desired for itself and that it is better to escape the "cold gradations of decay." After all can we improve on the words of the Psalmist: "The days of our years are three score and ten?"

Dr. Warthin is to be congratulated on having given a clear exposition of what old age is and how we should regard it. To accept it gracefully and with philosophy is the act of a wise man. To have resources in one's self is much of the secret. When the burden of the years grows heavy one can say as Will in Stevenson's tale, "Will o' the Mill," does to Death: "I have been waiting for you these many years. Give me your hand and welcome."

THOMAS MCCRAE.

Cum INDICE locupletiſsimo.

[From Franciscus Vallesius: Hippocrates. Coloniae, 1589.]

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